AWARD-WORTHY IT

E-REALITY CHECK

PREFAB PORTALS

BACKLOG KEEPS VISAS ON SHELF

At swamped INS, permanent visas delayed; guest workers might have to return home

BY JULEKHA DASH As U.S. lawmakers continue to fewer than 80,000 of the allotdebate whether to raise the visa

cap on temporary foreign work- cards. INS spokeswoman Evers, half of the employment-based permanent visus went unused last year. That's because of a severe backlog in visa

processing, which is forcing thousands of technology workers to wait three or more years Though employers exhaust-

ed the II5,000 H-IB visas six months into this fiscal year, the U.S. Immigration and Natural-

ization Service last year issued

ted 140,000 employment green leen Schmidt said a backlog in visa processing was partly to blame. The INS is now considering more than I mil-

lion green-card applications. Lisa DeFruscio, a human resources director at security software firm DefendNet Solutions Inc. in Providence, R.I., called the INS backlog "absurd," adding that the agency

INS Backlog, page 121

ALL-STAR VOTING FRAUD TARGETED

Baseball goes deen to tighten online security

Major League Baseball's All-Star Game has been taking great pains to make sure fans don't back, back, back for the

As voting to pick this year's players gets under way - the first round of balloting was posted online last week - All-Star officials hope to double online response, but without a A FAM SUE repeat of an incident that oc- for Nomer Gard

curred last season. That's when a fan from Carver, Mass., tried to stuff 39,000 votes for Boston Red Sox shortstop Nomar Garciaparra through the online balloting system. *Baseball, clearly, coming off

last year's issue, was con-cerned about this," said Tim O'Mara, senior vice president of operations at SeasonTicket.-All-Star, page 14



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OP-NOTCH

Company-paid classes in Spanish and yoga. The ability to choose your own projects. That's the

kind of work environment you'll find at companies in Computerworld's 7th annual list of the Best Places to Work in IT, the result of an extensive survey about staff training. teamwork and turnover

The first installment of this four-part series begins on page 61.



Legal experts say it may have a strong case

Microsoft Corp., trying to score points with a future appeals court, last week blasted

tified and riddled with errors. For months, Microsoft has been laying the groundwork for an appeal of U.S. District Court Judge Thomas Penfield Jackson's antitrust rulings. Besides opposing the decision that Microsoft abused its monopoly position, the company the government's breakup plan has repeatedly complained

that Jackson didn't allow it to call witnesses to debate the merits of splitting it in two.

Details of the breakup pre

posal will get more attention this week. Jackson ordered the government to respond to Microsoft's specific complaints by today. Microsoft can file a final rebuttal on Wednesday, and Jackson is expected to rule on the breakup plan shortly

thereofter

Microsoft, page 16



OMPUTER ASSOCIATES

OFF TO THE EXECUTIVE SUITE

in the growing world of e-commerce and ceitine marketplaces, technology is at the very core of business. So naturally, CIOs are in demand. If leaders, like Curl Bass (pictured), are becoming CEOs at their companies det-com spin-offs or taking the holm at new internet start-ups. Page 52



GOING IT ALONE

Have you been bitted by the entreprenent buy, like rikedom's president and recent founder. Brian Donner (pictured)? Are you chearing of hanging out your own shingle, to be your own employer? Then consider the words of wisdom from two who have done it.

COMPUTERWORI DTHIS WEEK

JUNE 5, 2000

NEWS

4 LAWSUIT RAISES questions about the legal bounds of thirdparty service providers updating legacy systems

B GETTHERE.COM plans a network that would link corporate customers directly

with airlines, hotels and car rental agencies.

growth in customer relationship management and supplychain software sales and slow demand for enterprise resource planning, analysts predict.

2 PALM INTRODUCES software to link handhelds with corporate information systems. 6 FTRADE MERGES with

Ernst & Young to offer personalized financial advice on the Web. 20 BAAN SALE LEAVES users wondering about the future of

the German company's products and support. 24 USERS ARE WARNED about a security hole in Net-

work Associates' Gauntlet firewall software. 28 CONGRESS SEEMS to be close to a vote on digital signature legislation

MORE	
Editorial Let	ers 32,33,38,39
How to Cont.	ect CW 120
Shark Tank .	
Stock Ticker	
Company Inc	lex 120

BUSINESS

50 COMPANIES ARE turning to Blinco Systems for personalized supply-chain software.

54 EBAY WINS the latest round in its battle against Bidder's Edge, but the final outcome

has yet to be resolved. 55 GM LEASES its OnStar technology to Honda in hope

of growing a new business. WORKETYLES WINNEBAGO Industries, a motor-home manufacturer,

finds hiring IT workers at its rural lowa offices challenging 58 B-TO-B EXCHANGES offer

firms several advantages, but there are also obstacles.

32 MARYFRAN JOHNSON

32 DICK HUDSON speculater

on the possibility that a

says IT leaders must flex their

muscles in the area of online

consumer privacy - before

Washington beats them to it.

"techie" like Scott McNealy of

THE BEST PLACES to work, determined by a Computerworld survey, are revealed.

72 UCITA HAS WON approval in a couple of states, but controversy still surrounds the software licensing and contracts bill.

79 TIVOLI SYSTEMS says companies that use its new Tivoli Device Manager can manage handheld devices running the Palm operating system through the company's

TECHNOLOGY

framework software. QUICKBTUDY 84 THE VIRTUES OF Wireless

Application Protocol and Web clipping are being debated as demand grows for handheld wireless Internet access. Learn more about both topics this week.

85 COMPUTING AGENTS and "bots" are radically increasing their value by communicating with one another, and they will significantly affect business

processes in the near future. 86 SOME ENTERPRISE customers are finding that it's more cost-effective to buy an off-the-shelf portal package

than it is to build the necessary tools themselves. The question is how well they do the job. as CEO of General Electric.

33 DAN DRAKE wonders if software buyers are partly to blame for the mess in which Microsoft finds itself.

38 JOHN GANTZ believes a coming shortage of electroni business professionals will eclipse the IT skills shortage

Sun Micronystems could succeed the legendary Jack Welch

busloads of consultants in a building and setting them up for two years is not a winning

Landing three

Proposition.
REVIN CORTELLO, MARADIST PARTHER
OF THE ORITICAL MAINETS PRACTICE
AT ARTHOR AMERICASES ILP.

DN INTERRET PROJECTS, WHICH SMOULD BE ENORT ARD INTERSE, BOT LINE YEARS-LORG ERP IMPLEMENTATIONS. SEE PARE SR.

> Congress: Allow Internet commerce to be taxed. It's only fair.

56 PAUL STRASSMANN questions whether General Motors' move into information-based services will

deliver more profit.

122 FRANK HAYES speculates on the "worst-case scenarios for IT should Microsoft be solit to two.

More Linux Lavoffs

TurboLimes Inc. in Brishams, Calif. iast week became the third high profile Linux company in a month to nce job cuts. The company idn't say how many jobs were cut but decied earlier reports that her breedend "at least 50%" of the staff in several departments. Two days later, Chairman and CEO CEF for relinquished his CEO duties to pany President T. Paul Thomas. Last month, LinuxCare Inc. in Son Francisco canceled its initial lic offering and announced un fled job cets. Corel Corp. in es, which has been restyling off as a Linux company, also is and to cut several hundred iobs as part of a restructuring und

soord Capital Corp. in Yances-ritish Columbia.

Frequencies Approved

ns reached at the Interne-

Gail Schoettler, head of the U.S. legation, said the Federal Com-

r to accommodate fixed and mo

tior said the U.S. "get every

ion industry to track

ing from trucks to ship o

civil satellite users that will pro-

is better accuracy than the cur-

g it wanted and more" in terms

ow frequencies for the Globa Hening System, used by the

ns Commission will study

ATDEADUNE Metro Networks Cut Costs, Complexity

Emerging technology enables customers to run Ethernet over MANs for the first time

NSTEAD OF leasing highspeed phone lines for thousands of dollars per month, Matt Kesner chose a metropolitan area network (MAN) based on Ethernet standards running over certical fiber Verner ClO or law George

wick & West LLP in Palo Alto, Calif, is among the first people to use an emerging infrastructure that promises to bring more bandwidth, lower costs and easier connectivity to companies lucky enough to have unused fiber running by their buildings. He uses a MAN - a high-speed network that covers a geographic area such as a city or suburb - to connect the law firm's offices

in San Francisco and Palo Alto. While MANs have been ence in lebut, Turkey, which ended Friday. used for years, some of the tes to the ITU approved three biggest names in technology are investing billions of dollars to allow customers to use them cated in the U.S. for "lastfor the first time at relatively o" fland wireless service by com-nes such as MCI WorldCom Inc. low prices and on common standards such as Ethernet. Just last week, Lucent Techpologies Inc. in Murray Hill.

N.J., announced that it would buy Chromatis Networks in Herndon, Va. for \$4.5 billion (see story, page 30). With the deal Lucent pers Chromatis' technology for increasing performance in MANs. And Nortel Networks Corp. in Brampton, Ontario, has announced its Optera line of

MAN products. **Bark Fiber Used**

But some users aren't waiting for these products and are setting MAN service from providers such as Yipes Com munications Inc. in San Francisco and Telseon Inc. in Denver. Both companies purchase existing dark (unused) fiber and use it to create Gigabit Ethernet MANe

"We were using four TI lines from a local telephone company." Kesner said. "We were went well beyond the standard

we've reduced that to about It took 10 days to set up the

MAN, Kesner said, compared with the eight months it took the local telephone company to install a separate circuit to bandle souce smille Another early adopter is Philip Kwan, an associate director of network infrastructure at Incyte Genomics Inc. a. biotechnology research firm in

Palo Alto, Calif.

neal fiber Gigabit Ethernet on its main campus but it needed to send hundreds of megabits of data to remote sites where its e-commerce applications are bosted and it needed to manage those applications remotely. "If we were using a telco to manage these boxes, it wouldn't be possible," he said Tom Jenkins, director of

in Boston, said the use of such MANs may be limited because most unused fiber is in downtown areas not suburbs Yipes spokesman Ionathan Marshall said be disagrees. "There's a lot of dark fiber out

Kwan said Incyte had an op-

consulting at TeleChoice Inc. available, if not, he said, new high-speed technologies such as dense wave division multi-

AT A GLANCE What's a MAN? Features of a metropolitan

oreo network (MAN) Connects buildings in the same metro. area and on large campuses Generally curs on pursion public intrastructure, such as unused optical liber that n lessed or owned by a MAN service

The newest breed of MAN uses Ethernet standards for seemiess connection to cover pares' LANS

there. Energy utilities, municipalities and carriers have buried it. You just have to know where it is." Analyst Peter Sevcik at Net-Forecast in Waltham, Mass., also said there's plenty of fiber

plexing and 10 Gigabit Ethernet could boost the hundwidth of the fiber that can be used.

Lawsuit Pits Copyrights Against Third Parties

Legacy software changes contested

An obscure 6-year old lawsuit that moved into the verdict phase last week starkly highlights the challenges - and costly options - corporations face in maintaining aging coterprise software.

At issue is the question of how far third-party service providers can go to maintain legacy software packages for their customers without violating the copyright of the originst software vendor.

Involved in the dispuse are two relatively unknown software vendors: Toronto-based Geac Computer Corp., and Parsippany, NJ-based mainframe consultancy Grace Holdings Inc. Both have been

slugging it out in a federal court in New Jersey since 1994. Genc claims that Grace broke copyright laws by modifying Geac's mainframe software while providing thirdparty software maintenance services to customers

In the suit, Geac claims that the code modifications made by Grace and its customers companies that want to customize mainframe software to Grace, which specializes in maintaining legacy software, in turn claimed that Geac was il-

legally using its copyright to revent customers from hiring less-expensive third parties to service Geac software. The dispute illustrates the kind of tangle users can get

into when dealing with asing enterprise software in the absence of long-term contractual safeguards, said David Ochroch, a consultant at Reiner Associates Inc. in San Rafael. Calif

The ability for a company to bring in [an outside consultant) to modify a vendor's source code has to be negotiated up frost," Ochroch cau-Otherwise "software modifi-

cation by third parties brings up copyright and derivative work issues," he said. ina Software in Dispute

The software in dispute was seine mainframe accounting packages originally sold by a company called McCormack & Dodge and then later by Dun & Bradstreet Software. It was Dec Software that first filed

suit against Grace Consulting in 1994. D&B Software was acquired by Geac in 1997.

Medical Economics Co. decided to sign up with Grace because its services were far cheaper than those of D&B Software, said Nick Sanghyi, an accounts manager at the Montvale. N.J.-based company.

"We were paying between \$50,000 to \$60,000 a year in maintenance fees to D&B, and we weren't getting anything back in terms of new functionality," recalled Sanghyi. In contrast, Grace offered better service and functionality at around \$20,000, he claimed. Atlantic City Electric Co. -

now part of Conectiv. a \$3.1 hiltion utility in Wilmington, Del - moved off D&B majore nance when it discovered that setting new functionality would mean a disruptive up grade to a new version of the software, said Burt Looez, an account manager for planning and performance at Conectiv. The company didn't want to pay for a reinstallation and decided to maintain the software

it had through Grace because it was cheaper, Lopez said. A Geac spokesman said the company only would com after the verdict was an-

Boo.com's Domain. **Brand Names Sold**



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Users Start Wrestling With Sun's Java 2 Spec

Six months after release, many take

gradual approach BY LEE COPELAND

UN MICROSYSTEMS Inc.'s Java 2 Enterprise Edition (J2EE) specification was set in stone last December. But some users said they're just starting to grapple with how to implement the new de-

velopment environment Cleveland-based drivetrain and engine component maker Eaton Corp. will keep its lava order-entry applications to their current nonstandard forms rather than migrating

them to J2EE Chicago-based Bank One Corp. is implementing pieces of the specification it needs the most, with plans to add more in the coming months.

changes, and the changes would only be in specific areas like the EIB or the IDBC

ident at Bank One's commercial division, said a team of 20 developers has been implementing the IZEE specification for servicts, JavaServer Pages (JSP) and Java Database Connectivity (IDBC). The next step will be Enterprise Java-Beans (EIB) and lava Message

Service (IMS). Premium-coffee kingpin Star bucks Corp. in Seattle designed a flexible application architecture to make it easier to plus new IZEE elements into its

Web applications. "Most of the work that we've done will be portable," said Michael Marshall, lead application architect at Starbucks "We've structured lour applications) so that we could make

These examples illustrate

the choices companies face

tion development. They can Eston. "But chances are that use a limited set of elements most of our Java apps will conand swap them out when possitinue to run unmodified I with ble, conduct a costly wholesale nonstandard code), even if we migration or continue to use need to use separate machines old and new versions of lava. to host those applications."

IZEE, a set of specifications Meanwhile, many customs for building server-based Java will adopt parts of the stanapplications, includes the FIB components; JSP, for displaying dynamic content in Web pages; and Java servlets, which are server-side lava compo-

nents that perform functions such as gathering data from a J2EE also includes interfaces to provide database access. transaction processing and

other functions Sun hopes the I2FF set of specifications will make it easier for developers to write Web-based applications that will run on a wide range of server products. Most major vendors have said they intend dard as they need them to support the specification.

"The J2EE spec is good because it takes a set of technolo gies and forces vendors to bend to support it, which in turn makes development easier in the future," said Clayton Ferguson, a project manager at

*Everyone wants to do IMS. EIB and IDBC, because they are the care Japolication programming interfaces]," said Carl Zetle, an analyst at Giga Information Group Inc. in Cambridge, Mass. Steve Garone, an analyst at

International Data Corp. in Framingham, Mass., said interest in the various elements of IZEE now varies based on customer needs. But for users developing enterprise applications, eventually "all the spece will come into play," he said.

OBC: Jum Batalian Connectivity - The see that allows Java applications to acce MS: Jum Managing Service - The pro-nat allows Java programs to message in

Sun Revises Community Process

o its community process for dereleping new Java technology.
The upgraded Java Community Process (JCP 2.0), to be un-

at this week's JaveOne or further development among rorking groups. In the past, that

e the community a level of ensurance that we're [going] to sep the playing field level and low others to participate in the occess, "said George Paolini, ding that the new setup loos embles the balance of powe in the U.S. government. Ho n will remain "steward" of Java

rendor, that's still too much conit one company's hands.
"While there have been some baby steps improving the JCP process, the bottom line is [Java] still is not an open standard," said Scott Hebner, director of electronic-business marketing at IBM

which has balked at licensing Sun's Java 2 Enterprise Edition. "We believe strongly - as original to coveratted by Sun - that Java ought to become an open industry standard. By definition, an industry standard is not controlled by a

ingle company."

Lisst year, Sun abandoned hec separate efforts to standardize Jove through independent bodie - one through the international Standards Organization and the

other through ECMA. Instead, Sun has co mak its community process to ioping Java specifications. rd Co., Apple Computer Inc Compaq Computer Corp. and One cie Corp. The first general exeru-

New Sun Tool May Revive Interest in Client-Side Java

BY CAROL SLIWA Vendors revamping their server products to support the latest enterprise lava technology won't be the only companies

making news at this week's annual JavaOne conference in San Francisco The company hosting the show, Sun Microsystems Inc., will unveil a new prod-

not that could revive interest in lava on the client. The **JavaOne** company's Web Start, which will be available this year, will provide a mechanism for downloading and cachine lava applications

Right now, users typically have to execute a Java applet each time they visit a site. With WebStart, they will be able to click and download the Java application only once

WebStart is based on Java Network Launcher Protocol, which makes sure the user has

the correct lava virtual machine (JVM) needed to run an application. If the user's machine doesn't have it, the JVM is downloaded from a server

along with the application, according to a source familiar with the product. Many developers have shunned client-side

Java work because of slow performance and uneven support for critical lava technology in "This addresses some of the [performance] issues people

had in deploying client-side Java," said Steve Garone, an analyst at International Data Corp. in Framineham. Mass "We're going to see more interest in Java on the client" as use of products that try to work around browser-based lava problems increases, he said. Although WebStart will address some issues, some companies may still be reluctant to use client-side lava. "WebStart Imay! solve the

performance issues of loading classes, but not the firewall issues that some corporations are uncomfortable with," said Kas Naderi, CIO at Municipal-Trade.com in Atlanta. He noted that some companies doo't permit their employees to

download Java Naderi said his com plans to use server-based Java in setting up its electronic marketplace for municipal bonds but plans to use only HTML, JavaScript and perhaps JavaServer Pages to meet its client needs.

In other news at lavaOne. IBM plans to announce a tool set, WebSphere Business Components and Enterprise Java-Beans components that aim to speed development of Web applications. Component target areas include supply-chain and customer relationship management in financial services and other industries, a compa

ny spokesman said. WebSphere Business Com nents will ship this year. Early versions are available on IBM's alpha Works Web site.





205 Writes Denking Solutions ists customers of all types of financial institutions: large and small - conduct their business from anywhere. 24/1, EGS is the first company in the work to derwise pitters capabilities with coasife-to-cast coverage for the new Pains VIY handhold. And we indepath the service with all your applications. It's secure. It's easy to use. And it comes with the most comprehensive customer service anywhere. From the burdword on the heart, your customers will here you. So team more visit on the bard are call 6000 pit.

BRIEFS

Too 10 Internet Threats

on Gateway Interface pro-

NS also pected the five worst ity mistakes committed by e-mail attachments without verify ing the source. More information ut these lists can be found at

Online Sales Edge Up

The Department of Comme na commerce sales rese 1,2% in the first three mostles of this year to \$5.26 billion, from \$5.196 billion in the fourth quarter of last year. Howover, coline sales represented only 0.7% of \$747.8 billion is overall retail sales during the first quarter. marce Department has released es-

Study: People Won't Pay for Online News

Tity-five percent of people who s ray for critice naves services, ac-cording to results of a study by in-Express LLC in Greenwich, n. Of the 300 res the survey. 27% go coline for local ws, 27% for world news, 25% nal news, 8% for sports ws, 5% for business news and 6 for financial news.

Nasdag Stocks Start Trading in Hong Kong

in a pilot program that started to week, seven Needaq stocks - Ar on Inc., Applied Materials Inc. and Startucks Corp. - began trad ing on the Stock Exchange of Hong alve for Hong Kong rs to buy and self those stor ich will be traded in Hong Kong

Dot-com to Offer Direct Link to Travel Suppliers

Will charge corporate clients lower fees than middlemen

CORING TO slice into the market dominated by established computer reservations systems. Get-There.com Inc. plans to launch a network this summer that will connect corporate customers directly to major airlines, hotels and car rental agencies.

By de-emphasizing the role of the middleman, GetThere hopes to charge lower transaction fees and undercut much of the business that currently flows through Sahre Holdings Corp., WorldSpan LP, Amadeus Global Travel Distribution and Galileo International reservation systems. Those companies didn't return phone

calls by press time. Menlo Park, Calif.-based GetThere has already signed up United Air Lines Inc., Northwest Airlines Inc., Trans World Airlines Inc., Marriott International Inc., Radisson Hotels & Resorts, Starwood Hotels & Resorts Worldwide Inc., Avis Rent a Car Inc., Budget Rent a Car Corp. and The

Hertz Corp. for its supplier GerThere will put those suppliers on a business-to-business network with major corporate clients such as Xerox Corp. in Stamford, Conn., Lucent Technologies Inc. in Murray Hill, N.L. and Nike Inc. in Beaverton, Ore, allowing buyers to get information directly

from vendors. Stx-Figure Savings

*Reducing agency fees will save at least six digits on our travel spending," said Pam MolL a travel services manager at Xerox in Rochester, N.Y. 'And that's just by booking online rather than going through the traditional channels,"

based Northwest's manager of e-commerce marketing, said many corporate customers have approached the airline

*Everyone thinks this is going to reduce distribution costs, and if they want to go through a direct solution, we have to meet that need" he

The idea is hardly a new one - e-Travel Inc. in Waltham. Mass, for example, offers companies direct connections to Delta Air Lines Inc. and Continental Airlines Inc. But lett said, the vast majority of Northwest's husiness still flows through traditional computer reservations systems.

There's a lot of start-ups surfing on the edge, looking to do this sort of direct stuff. But GerThere is the first in this particular segment we think has a lot of legs," said Scott Bush, vice president of sales and distribution at St. Louisbreed TWA

He said that direct bookings

could contribute "hundreds of millions" to TWA's revenue over the next decade and that GetThere's client list of "mar-

suppliers in one marketplace.

the airline to join the network. "Their product opens doors for a small carrier like TWA is may not have been able to open for itself," Bush said. GetThere's corporate client list should draw more supp into the mix, said Kate Rice, an



online travel analyst at Sherman. Conn.-based PhoCus-

Wright Inc. The one advantage the [computer reservations systems] have had over the internet is their collection of major

[GetThere's Supplier Network] really poses a challenge to that," she said

*Once these folks have tested the waters and reported back as guinea pigs that all is fine, you can expect more will fol-low," said Henry Hartevelds an analyst at Forrester Research Inc. in Cambridge, Mass.

leff Palmer, GetThere's vice president for strategic development, said his company will need to be aggressive in continually improving its services once the network launches. "We certainly think this is

the first wave, not the total," he said. *Functionality and scalability will be keys for us." Palmer noted that the use of XML standards in the travel industry and general business community helped make the integration of suppliers and users a much easier task. Harteveldt said GetThere and e-Travel "are definitely leading the industry down a

new path "But the [computer reservations systems) are huge organizations. They won't take this lying down," he added, "We'll have to see how they respond and how they try to add value when someone else has come

up with a cheaper model." Otocle's support as "transitional," meaning Oracle addresses only "critical bues." leaving the customer to solve

less severe probl Gary Hensley, director of IT at Odwalla Inc. in Half Moor Bay, Calif., said the natural juice drink maker is in a better position than established Oracle customers because Odwalla is replacing a non-Oracle system with Ili applications on the 8i database. The com started loading Release Ili fi nancials last week and expect ed to complete that installation today, thanks to an autoinstallation feature that "saves days of time," Hensley said. The "front-to-back" Oracle implementation is replacing a cus-

tom application that uses Mi-crosoft Access and Excel. Hensley estimated Odwalla's transaction volume to be about 1,000 orders per week entered by mobile sales associ-ates using mobile wireless input devices and about 200 orders per week from on-site customer service representa-

Oracle Completes 11i Suite

But need to upgrade across board puts users in no hurry

BY CHRISTING MCDERVES Oracle Corp. customers have been slow to follow the compamy's exhortation to run their businesses online, and last week's completion of Oracle E-Business Suite Release Ili appears unlikely to motivate many more of them The final modules in the

suite are an order management application that enables orders to flow from customer operations through the supply chain by interoperating with other Oracle applications, such as Telesales and iStore, and a customer relationship manage-Steve Jett, Minneapolisment application.

However, the product suite has a built-in obstacle hecause current customers can't upgrade one element without

For example, 111 applications run only on Release 8i of the Oracle database, released earlier this year. But many customers continue to run a vintage, character-based version of the Oracle Release 10.7 ap-

plication suite on early versions of the database. One such company is Integrated Measurement Systems Inc. in Beaverton, Ore. It doesn't want to be among the first to upgrade to the Webbased applications, but it does plan to start testing the software this summer, according to information technology di-

rector Jeffrey Thompson. "We'll embark on the project early next year," he said Oracle acknowledged widespread use of Release 10.7 late last year, and said it would continue to support the suite through 2001 rather than remove it from active support this year. Thompson described





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Forget ERP; IT Dollars Shift to Customer Apps

For the next five years, large

technology budgets on bestof-breed software and projects companies will spend a hefty designed to streamline supply

relationships, according to Boston-based AMR Research Inc. The Internet is driving com-

buy IT training, Fast,

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panies' attention away from back-office systems and steering them in this new direction. said analyst Rod Johnson at last week's AMR conference for IT executives bere-"The focus is on e-business.

be said. "The underlying priorities of IT organizations have changed." Between now and 2004, pur-

chases of supply-chain and cus-tomer relationship management (CRM) software are likely to grow 35% to 40% annually. reaching a combined total of more than \$40 billion, AMR analysts said On the other hand, sales of

rprise resource planning (ERP) applications, such as SAP AG's R/3 software, will slow significantly. AMR perdicted. ERP purchases are expected to grow by just 5% per year, according to AMR's survey of 1,400 software vendors and representatives from 1,000

companies across 13 industries. William Irons, CIO at Lowe's Cos. in North Wilkesboro. N.C., said his company fits the AMR profile of moving to customer-facing activities.

Lowe's, a \$20 billion home improvement retailer with 589 stores, is testing an Internetbased "hub" where its smaller suppliers can retrieve electronic purchase orders and eoter invoices.

The tarreted suppliers such as local nurseries that supply garden plants, often don't have electronic data interchange capabilities, so they fax a combined total of 30,000 invoices each week to Lowe's, Irons

*But if we set them up on the Internet with a browser-based interface, they can send invoices and we can send our purchase orders to a Web site." Irons added

Lowe's is testing the system with 10 suppliers and eventual ly may migrate eyeo its largest suppliers to the same hub. Such a move could save individual suppliers as much as \$3 million to \$5 million per year in value-added network charges, Irons said.

Life Fitness, a Franklin Park. Ill-based manufacturer of exercise equipment, just spent about \$2 million implementing an extranet for its dealers, who can receive a better discount for placing their orders online They also get direct access to in-depth product and customer information.

*Our philosophy is that the company that will win is the company that is easiest to do business with," said Augie Nieto, president of Life Fitness It's a philosophy that's already paying off, be added.





In business, it's who you know. And what they know.

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NEXTPAGE

Amazon Deal Boosts HP's Standing in Dot-com Market

leff Bezos says HP offered 'best package'

EWISTE PACEAGO Co.'s continuing hid to be recornized as a major Internet player got a boost last week when Amazon.com Inc. signed HP as its primary server supplier. As part of the agreement, HP will provide more than 90% of Amazon's technology requirements during the next 18 months, said Jeff Bezos, CEO

of Seattle-based Amazon. The

deal covers a wide range of Unix, Linux and Windows NT servers as well as software and integration services financial details relating to the sgreement. But HP CEO Carly Fiorina said during a press conference that Amazon has become one of HP's top five

customers worldwide In a companion deal announced at the same time, HP

will become an "anchor tenant" in Amazon's electronics store. This means HP products will be prominently featured and promoted on the site. which reaches an estimated 20 million consumers, an HP

week expands an existing relationship between the two

Last fall. Amazon purchased HP's high-end V-class Unix servers to power its main e-commerce applications during the critical boliday season. Amazon will migrate from its Compaq Computer Corp.

over the next 18 months. Bezon There was nothing wrong

with these [technologies]. HP had the best package," Bezos said when asked why Amezon chose to move to HP products. Amazon represents a major win for HP, a \$50 billion corporation that, like other systems vendors, has been trying to make a dent in Sun's dominance in the dot-com market. Last month, for instance, Sun warded off both IBM and HP to retain its contract as prime supplier to eBay Inc. "Everybody is really competing for the Internet infrastructure business," said Kelly Spang, an analyst at Technology Business Research Inc. in

"Amazon has got a lot of marquee value for HP," said Laurie McCabe, an analyst at Summit Strategies Inc. in Boston. "It's bound to get HP noticed among other dotcoms, especially in situations sesinet Sun." D

Hampton, N.H.

and Sun Microsystems Inc. Palm Ties Handheld, Enterprise Applications

Software lets users synchronize devices

Palm Inc. last week extended its reach into enterprise com-

puting with the introduction of synchronization software designed to link handheld devices with corporate informa-Palm said its HotSync Server

tem, including the Pocket PC

enables synchronization with enterprise groupware The software will initially support Palm handhelds, but the Santa Clara, Calif., comnamy said it expects to add sunport later this year for devices based on Microsoft Corp.'s Windows CE operating sys-

introduced in April.

management of handheld comrival of the software, which puters and applications. It also they view as essential for corporate information technology managers in an era of increasingly mobile computing. Christopher Fletcher, an an-

alyst at Aberdeen Group Inc. in Boston, said Palm's synchronization software marks the coming of age of handheld devices. Once viewed as anni ances by comorate IT departments, they're now thought of

as useful tools that need to be centrally managed in order to harness their nower he said "This gives (IT managers) the tools they need to manage these devices at the network level." Fletcher said.

But according to some analysts, Palm's focus on the Palm operating system and Windown CE is too narrow Bob Egan, an analyst at Gart-

ner Group Inc. in Stamford Conn., called synchronization software "one of the most critical new platforms" for IT managers. But he said such software needs to be "device-

independent." Grif Coleman, product manager for enterprise solutions at Palm, agreed. "There probably is a set of IT managers who want to have a multivendor solution," he said. "But we believe there is an even larger set of managers who want to have a consistent, single-vendor solution to their problems." lason Menear, a Duluth Minn-based network adminis trator at satellite con tions equipment design firm Vertex RS in Sterling, Va., was n HotSync beta user. Meneur termed the software "sin

dows NT server

and easy to install" on his Win-"It's much like using an office e-mail system," Menear said. "[But] it's not as fast or as up-to-date because of the need to replicate. HotSync will belp users in

tegrate Microsoft Exchange e-mail and the Exchange calendar with the Palm date book and mail applications. HotSync Server has a base price of \$2,400. Palm officials

Group Tells FCC Net Use on Ships May Cause Problems

A coalition of fixed wireless

users claims that Internet-atsea services launched over the past year by several cruise lines are a threat to public safety and the operations of critical infrastructures such as oads and oil pipelines

The group, which includes the Association of Public-Safety Communications Officials tional Inc., the Association of American Railroads. the American Petroleum Institute and the Fixed Wireless Communications Coalition, last month asked the Federal Communications Comon to revoke the experimental license it granted to a Miami company in 1996 to pro-vide broadband Internet service to cruise ships.

Telecommunications Network (MTN) in Miramor Fla - uses earth stations that operate on frequencies in the 6-GHz band, the same band used for fixed microwave communications by railroads, pipelipes and police Andrew Kreig, president of

the Wireless Communications Association International in Washington, which represents the fixed wireless industry, said signals from the terminals on the cruise ships could inter fere with "vital" fixed wireless

unications. Eliot Greenwald, an attor at Swidler Berlin Shereff Fried man LLP in Washington, called the petition "ill-advised." In a filing to the FCC, Greenrald said, "MTN has been op-



erating under an experimental license for many years, and there has not been even one case of suspected interference. not to mention demonstrated interference."

Greenwald said MTN had surveyed all fixed microwave links in shipping lanes in 17 U.S. ports, and even in the worst-case scenario, the MTN earth stations wouldn't cause

Glenn Farrington, CEO of Digital Seas International Inc. to deal with the request.

in New York, which uses MTN. called the wireless organization's FCC filing a "bunch of malarkey." Farrington said he believes the effort will fail because the cruise industry has more clout with the PCC. Revoking the MTN license

would hit the cruise lines which charge \$40 per hour for Internet access - in the pocketbook, Farrington said. The PCC didn't return calls for comment on how it intends 55% of network security breaches are inside jobs.

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FMC to Unleash McData in IPO

AcData Corp., an EMC Corp. sublary, filed for an initial public ing (IPO) of up to \$100 mil in Class 8 common stock with the curities and Exchange Commi sion. McClata intends to list with New York-based Handay Stock Har-tet Inc. under the Scher MCDT. EMC s to distribute all of its shares o plans to common an action to McData Class A common stock to its shareholders six to 12 months after the offering, Broomfeld, Colo.

Microsoft Secures E-Book Content

s publishers behind its Micros for electronic-book software. h leatures the company's n 800 titles will be available to r when it ships this sur

Strange Webfellows

or The Mation and The Mation when, well-known increase or to ends of the po

Short Takes

ernet eervices company ISTUF M CORP. in San Francisco, an nted servers man application era and an Oraciolii de and Communic --d, Vo.-based geospatial infer-tion technology software and vices provider. . . PEOPLESOF

Microsoft, Slashdot at Odds Over Kerberos

Copyright, open-source violations soar

HE KESSEROS SE curity protocol, which has been adopted by the Internet Engipeering Task Force as an open standard, is the subject of an ongoing dispute between Microsoft Corp. and the Slashdot are Web site which hours discussions about open-source

Microsoft claims that a Slashdot discussion thread that posted Microsoft's proprietary extensions to the open-source Kerberos protocol violates Microsoft's copyright and is illegal under the Digital Millennium Copyright

Act (DMCA). However, "Microsoft is in no way trying to limit industry dialog on this topic," said

Microsoft spokeswoman Luisa Vacca. Members of the Slashdot community argue that Microsoft is attempting to stifle free speech within the open-source

The Kerberos security protocol, which was designed at MIT in the 1980s, is used in Windows 2000 in a form that is partially incompatible with widely used versions of the standard. To read Microsoft's version of the specification. developers have to run an executable file that compels them to agree to a confidential licensing agreement. This angered some visitors to Slashdot, which posted instructions that tell users how to download the specification without

having to agree to the restrictive licensing agreement. On May 10, Microsoft attorney J.K. Weston fired off a letter to Acton, Mass-based Andovernet, which publishes Slashdot, demanding that the

instructions be removed. That entire mentality is completely against the whole open-source objective. Microsoft just doesn't get it," said Dean Williams a network engineer at Yesmail.com, a Chica-

go-based permission e-mail marketing company that uses Windows 2000. "You can charge money for anything that you add to open-source, but you have to make the source code available to anyone who wants to use it? Slashdot editor in chief Robin Miller refused to delete the II messages that Microsoft insists are illegal un-

der the DMCA. Instead, Slashdot shot back with a letter from its attorney. Mark D Robbins, questioning Microsoft's legal claims. Robbins said Andovernet is concerped about deleting the user postings "given their ap-

parent relevance to issues in the current antitrust litiention between the Microsoft and the sovernment." Microsoft appeared to be backing down from the dispute

last week "Was Slashdot the right bat-

tle to pick? Maybe, maybe not," said Adam Sohn, public relations manager for Microsoft's inside platforms division. Sohn said the letter drafted by Robhins disregarded Microsoft's copyright concerns, but be declined to comment on whether the company would continue to pursue Slashdot on alleged

copyright violations.

According to Microsoft, the Kerberos licensing agreen was put in place to protect Microsoft's intellectual property on the use of an undefined data field left open for Kerberos Version 5.0, which allowed developers to store authorization data for the Windows 2000 operating system.

"That field was set out by the framers of the standard for the special purpose of allowing vendors to put authorization data in it, so that was a snace for innovation," said Sohn, "We felt we wanted to protect that innovation and that invest-

Kerberos Copyright Conflict Questions asked by Slashdor astorney Mark I Microsoft's Kerberos copyright claim:

? How can Microsoft claim trade secrecy for a protocol that is distributed over the Internet?

? What measures has Microsoft taken to protect the trade secrecy of its Kerberos specification beyond the use of a click-wrap license agreement?

P. How could posting of the Microsoft Kerberos specification on Shahdor have any detrimental impact on the market for authorized distribution of Microsoft's version of Kerberos? ? Why shouldn't Slashdot users and the general public be able to view this protocol for purposes of commentary and

criticism in light of its apparent relevance to issues in the gov-erument's antitrust litigation?

Continued from page 1

All-Star

com Inc. in Bellevue, Wash., which is in charge of this year's electronic tabulations. "This site's high-profile and we know it." O'Mara added. Online voting, which started in 1996, last year collected some I million ballots, according to MLB. Another 5 million or so ballots were submitted

This time around, ballots can be cast on the site http://ulistar balloting.seasonticket.com until July 1. Fans will be allowed to cast 25 electronic ballots - an average of one for each home

game during the balloting period - from a single e-mail address. The game is July II. All addresses will be verified, daily audits of the votes will be performed and the totals will be posted daily rather than in real time, to allow time for those audits to take place,

"We're confident [crackers are) not going to cast an illegal vote that gets counted," he said. O'Mara said he believes the e-mail addresses will provide enough information to perform the needed security but refused to reveal details of how the process will work. "There are a few folks out there we'd just assume not know what we're doing," be said.

Last year, the culprit was caught when his votes came in too quickly from an identical

Outsiders' Doubts

Security experts aren't as confident as O'Mara that the new system will ward off crackers. Setting up a program to delay the votes and randomize the IP addresses wouldn't be too difficult for an experienced cracker, said Rob Clyde, vice

president for security may ment at Rockville, Md.-based Axent Technologies Inc. "They can punch up a rou-

tine and just let it run for a few days," Chyde said.

Michael Rothman, executive vice president of Needham, Mass-based security firm Shym Technology Inc., said the All-Star site will pose a ready made target for "anybody who can sling together a Java script." "Technology's amazing," be said. "It's bringing a level of efficiency in fraudulent activities that used to be done with

just brute force." Rothman said that Sea Ticket.com was on track in creating digital identification Clyde also suggested using intrusion-detection software and keeping core activities behind

an external firewall. Yet baseball fans have tried to stuff All-Star ballots for decades. For example, fans in Cincinnati populated the entire National League roster with their hometown Reds in 1956. And for a cracker comity that loves a challenge. the All-Star ballot is as tempting to swing at as a hanging

"We know somebody's go to try something," O'Mara said. network maintenance can take up 27% of your time.

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simplify LAN maintenance with intel® pro/100 network adapters, with singlidiment technology, you can install and martten your network connections using sits one core necessition from per to become, then you to severe to notebooks. The install: valuable time and money, saved this put one of the many new ways intel adapters are storing problems you never thought adapters could solve, make sure you specify intel adapters, because in the surpe economy, lost municies size mombine adapters, because in the surpe economy, lost municies size mombine of the surpe economy, do the numbers size when the provide up for commonly of the surpe economy.

Techies to Get Peek at Next-Gen Windows

Analysts skeptical about impact of NGWS

ESPECIF THE delay Microsusti's moch-anticipated Next Generation Windows Ser view (NGWS) rollout, developers are likely to hear some new details about the compony's plans this week. Industry analysts are hinting that NGWS may turn out to be less than it

has been cracked up to be Microsoft Corp. had planned to unveil NGWS, its vision of Web-enabled software services, last week. But the event

AT A GLANCE Tech Ed News

Amone the Windows 2000 tooks provinged or appounded Westernal 2000 (Notice Software) & tool for distribution acres in musel design etycoments, ecluded Wedows 2000 ActiveBatch 2 II (Advanced Seasons Concepts) Distributed of management

SerietLook Professional Edition (ScriptLogic) Chales log-on-scripts and

other screene Patral (BMC Software) New components ed to democratures tives have binted that Win-

was resilied back to home 22 of ficially because a decision in the commony's antitrust case could overshadow the rollout But according to Steve Kleynhans, an analyst at Meta Group Inc. in Toronto, initial negative feedback from those who previewed parts of NGWS may have contributed to the delay However at this week's Tech and Chief Software Engineer

Bill Gates is expected to give his keynote on NGWS. But no sessions on it are planned. Technical sessions are planned on established Microsoft product lines such as \$vchange 2000 and COMs. "It's really hard for these developers to follow Microsoft's lead if fit isn't! saving anything," said Dan Kusmetzky, an analyst at International Data Corp. in

Framingham, Mass. NGWS is Microsoft's plan for transforming its various software products into services that can be offered on the Internet. These services will be accessed from various devices using the standard XMI Inc., auto insurer Geico Corp. protocol, but Microsoft execuand entertainment company

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Continued from page I

Microsoft

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DreamWorks SKG, Microsoft

Holdings Inc. analyst Richard | ly has an agreement with Repetto. Earlier this year, DirectAdvice.com Inc. in Hart-ETrade acquired Portland. ford, Conn., to provide cus-Ore-based Cont

> E-Partners What they bring to the new, unnamed inadvice company:

 26 milion customer · Internet experience e \$25 milion ■50.196 ownership Frost & Young

> ■1,000 Imancial advis ■80 employees ■ \$25 miles

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If NGWS is a mere repositioning of existing products. it's still a momentous event. said Kleynhans. "This is on the level of what they did with the Internet in 1995, where they sat 2000) as its strategy for disdown and said, 'We have a lot tributed Web applications. of good products, but we have Many of the components of no real strategy," he said.

say a Microsoft appeal will take one of two ro NORMAL PATH: Microsoft appeals to the U.S. Court of Appeals in Weshington, the court sets a schedule for briefs and grail arguments and renders a decision, a subse overal appeal would go to the U.S. Supreme Court. If it took the case, it would accept

briefs, hold and arguments and issue a ruling. Bapased times two years, or more if portions of the case are sent back to the tool auto-FAST TRACK. Either Jackson or one of the parties seeks a direct appeal to the Supreme Court, which then decides whether to accept the case; Supreme Court ac cepts briefs, holds oral arguments and issues a ruling. Elapsed times one year or

claimed that they would have testified against the breakup. on the grounds that separating Microsoft's operating system and application software units would cause integration and

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cuarter.

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to luckson for more work William Kovacic, a law professor at George Washington University in Washington agreed. He said luckson did a masterful job of balancing

speed and careful analysis until the remedies phase. Kovacic said the judge could have bought "some relatively cheap insurance [against a reversall if he'd given Microsoft a month to put on a show" with witnesses 9

ETrade, Ernst & Young Pair **Up to Offer Financial Advice**

Online advice-takers expected to hit 10M

FTrade Group Inc. and Ernst & ries. FTrade's entrance into the Young LLP have joined togethonline financial advice space er to form a firm aimed at demakes sense because the comlivering personalized financial pany needs to expand its revadvice over the Internet enue sources, said Linda Alt. The move will give ETrade an analyst at Gartner Group

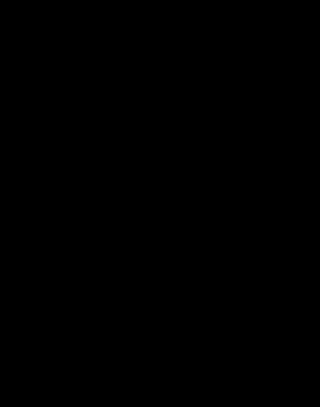
access to the growing market for online financial advice, according to Rob Hegarty, an analvst at Needham, Mass,-based TowerGroup. According to Hegarty, there

Capture Services Inc.'s network of 8.500 automated teller machines. It financial advice accounts in

also recently our chased retail space in the Super Target department stores Minneapolis based Tanget Corp. "These mea

sures are a step in the right direction," said Repetto. "le's ann early to determine their ef fectiveness and whether they will be accepted by retail investors. ETrade current

• 20.000 customers = 49.9% ownership



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Tech Ed News Among the Windows 2000

tools previewed or announced: Winlestall 2006 (Ventas Software) A tool for distributing ages in mixed desktop anversaments, including Windows 2000 ActiveBatch 3.0 (Advanced System

Concepts): Distributed job management

(ScriptLogic) Creates top on scripts and Patrel (EMC Software): New components

was pushed back to June 22 officially because a decision in the company's antitrust case could overshadow the rollout. But according to Steve Klevnhans, an analyst at Meta Group Inc. in Toronto, initial negative feedback from those who pre viewed parts of NGWS may home contributed to the dalay However, at this week's Tech Ed event in Orlando, Chairman and Chief Software Engineer Bill Gates is expected to give his keynote on NGWS. But no

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advice over the Internet The move will give ETrade access to the growing market for online financial advice, according to Rob Hegarty, an analyst at Needham, Mass.-based TowerGroup.

According to Hegarty, there

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down because of market worries. ETrade's entrance into the online financial advice space makes sense because the company needs to expand its revenue sources, said Linda Alt. an analyst at Gartner Group

Inc. in Stamford, Conn. The joint venture reflects how Menlo Park, Calif-based ETrade is moving away from its pure electronic-business model, said Lehman Brothers

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■\$25 million sures are a step in =50.7% ownership the right direc-Ernst & Young tion," said Repetto. "It's too early to = 20,000 customers determine their of-=1,000 finencials fectiveness and whether they will ■60 employees be accepted by re-■\$25m@on tail investors." # 49.9% own

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the average company loses \$3 million a year on LAN downtime.

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help prevent server crashes with latel pro/100 and pro/1000 server adapters. simply install two or more server adapters and configure adapter fault tolorance, now you have an emergency backput ink between the server and the network. If the switch rough port fails, a cable breaks or an adapter malfurcitions, a secondary link locks in so your customers get through, and they sky your customers, this is just one of the many new ways intel adapters are solving problems you nover thought adapters could solve make zour you specify intel adapters, because in the surge economy. So your convey, only our "feathcomp for the surge economy," and comply-pipe our "feathcomp for the surge economy," and comply-pipe our "feathcomp for the surge economy," and comply-pipe our "feathcomp for the surge economy, and complying the pipe for the surge economy, and complying the pipe for the surge economy, and economic pipe for the surge economy.

CONTENT SECURITY. THE GOOD. THE BAD. AND THE UGLY.

"Businesses lost \$7.6 billion in enterprise system attacks the first six months of last year alone." (Without counting, hundreds of millions in lost productivity.)

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OIO YOU HEAR THE E-MAIL JOKE ABOUT THE GUY WHO COST THE COMPANY MILLIONS?

The one about the tasteless joke some clown thought was funny. It wound up in an e-mail box that resulted in a \$2.2 million sexual harassment lawsuit.

The fact is, last year the Supreme Court ruled

companies are liable and responsible for inappropriate e-mail communications between employees, regardless of whether or not the company was aware of the communication.

And improper use of e-mail privileges not only leaves you vulnerable to lawsuits, it exposes you to loss of confidential, proprietary information. For example, employees who inadvertently send sensitive corporate



trade secrets and strategic documents like salaries or financial plans.

By scanning e-mail usage, you can monitor suspicious content and reduce e-mail volume, thereby boosting bandwidth.

SOME TEENAGERS HAVE AN EASIER TIME Writing Malicious Code Than Getting Dates.

Some can be mischief-making 15-year-olds writing

malicious code. On the other hand, there are real ugly enemies out there.

Rogue employees and virtual terrorists bent on stealing company secrets, spreading malicious viruses, crashing servers, and potentially causing economic chaos.

If someone hates you, without intrusion detection they can electronically paralyze your site, the streaming videos of sports highlights.

Perhaps a good employee, but an unwitting threat to your organization. For as he's accessing inappropriate sites, he's also unintensally exposing the enterprise to malicious code, software incompatibilities, and potential liabilities.

This misuse of Internet privileges has significant real costs. It drains bandwidth and

> company resources. In just one month, non-work hours spent on the Internet can cost a corporation hundreds of thousands of dollars in lost productivity.

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perform industrial terrorism, and even hold your business for ransom.

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Baan Is Rescued, but Users' Concerns Remain

Layoffs, integration with Invensys rouse skepticism amid firms' rosy promises

HE FATE of Dutch business software maker Basn Co. is now known, but that of its users is

less certain After seven com ters of losses and leadership woes that saw four CEOs at the belm within 18 months, Baun last week was potentially rescued by Invensys PLC's offer to buy the company for 762 mil-lion euros (\$708.7 million). The deal is expected to close late next month or in early August, said Allen Yurko, CEO of vensys, a London-based supplier of industrial automation conference call with analysts. If the deal is consummated, Baan will be integrated into a newly created division called uating Invensys and noted

Roche, Baan's chief marketing officer, 1,000 jobs will be cut from ISS, with the bulk of the layoffs coming from the Baan side. Baan, which specializes in enterprise resource planning (ERP) and supply-chain software, currently has a work-

force of A 300 Users and analysts questioned how the cuts and the ISS integration will affect Baan's products and support. Craig Mey, vice president of manufacturing services at Phillies Plastics Corn in Phillips, Wis., said he has followed Baan's financial woes with interest, hoping that the company would stabilize sufficiently to maintain and expand its product line. Mey, whose firm uses supply-chain modules as well as other Baan products, said he is still eval-

Invensys' Acquisition

Invensys will buy Basas for 762 million euros (\$708.7 million)

The deal is expected to close in late July or August.

Raan will be folded into the Inventors Software and Syste (ISS) division. It will continue to be based in its current head-quarters and will be run by Laurens Van der Tang, who is cur-

rently executive vice president of R&D at Baan The ISS division is expected to have annual sales of \$2 billion. More than 1.000 employees of the ISS division will be laid

off, most of them from Baan. Invensys is looking to reduce Baan's costs by \$60 mi

\$120 million per quarter by year's end. It will incur \$400 million in restructuring costs during the next 18 months as a result of the Baan acquisition.

complement Baan's offerings. Keith Bearden, CIO at dental equipment maker A-dec Inc. in Newberg, Ore., said he's relieved that Baan wasn't acquired by another ERP company that might force Baan's installed customer base to switch to its software. "I'm not

ready for another ERP installa tion. It's too prinful," he said. Still, Bearden said be is uncertain about Invensys' plans for Baan, in light of the lavoffs and its stated intention to cut costs (see chart) Invensys said in a statement last week that it is committed to Baan's research and development program and its suite of products. Roche also stressed that Invensys "will continue with [Baan's] products and won't change the product direction." But Bearden seemed uncor

vinced. "I have a lot of ours tions, and it's too early to tell," Above all, he wants Invensys

to improve support, "because a lot of good people left," he said. Bearden noted that A-dec has gone through four Basn account representatives in 16 Baan customers are relieved now, said Ed Markowitz, CEO

of ChainNet Research AG in Cincinnati, But despite Invensys' assurances, customers are concerned about Invensys' plans to maintain Baan's existing products, Markowitz said. Laurie Orlov, an analyst at Forrester Research Inc. in Cambridge, Mass., expressed some skepticism.

"There's still some hope invensys will see an opportunity to re-energize Baan's suite as a viable alternative, but it will be hard because the company is being pulverized by downsizing," Orlov said. As a result, there will be "a blurred [Basn] brand, a terrified customer base, slice-and-dice employe and an alienated knowledge workforce," she said.

Kit to Boost Fault Tolerance of NT Servers Borborn Mass shared Mars-

vensys Software and System | that his initial impression is

(ISS). According to Katrina that the U.K. firm's products

Marathon claims

99.999% uptime

Marathon Technologies Corp. this week will introduce an enhanced version of its highavailability kit for Windows NT servers featuring new technology for tying dualprocessor Intel Corp. servers into near fault-tolerant config-

Marathon's new Multiprocessor Endurance 6200 hardware and software technology will also allow Windows NT s to increase the geographical distance between their servers to 500 meters for better ster tolerance. The tool kit will be priced at less than

thon has been trying to carve a niche for itself selling a patented technology called ComputeThru. The company claims ComputeThru delivers 99,999% uptime - or less than 5 minutes of downtime annualby - on Windows NT server hardware.

Hewlett-Packard Co. will announce models of its NetServer systems this week featuring Marathon's new technology. HP has a reseller agreement with Marathon.

No Service Disrustion

At a basic level, Marathon's oach involves tying four Intel servers together into one large, logical server array. The array is split into halves, with each half running the same application identically and in

If one half of the array fails, the application keeps running on the other side, said Craie Compute Thru

Goes the Distance Marathon's approach to high-availability Windows NT

into a single large logical server array · The array is split into two halves Each half consists of two servers - a

compute server and an VO server Network interface cards and patented synchronization softwa link the two halves and allow the both halves at the same time

Jon Anderson, a director at

The approach ensures that there is no single point of hardwere failure, Anderson added. It also ensures that there is no service disruption in the event of a hardware failure, said Depis Nothern, inform tion technology director at Mothernature.com Inc., a Concord. Mass-based online re-

tailer. "The fact that the [array] can continuously run and be fixed without taking the whole platplications, he said. form down is remarkable when compared with other spdor offering five nines of sys-tem availability in the NT inproaches, such as Microsoft's Windows NT clustering techdustry at this time," said Joe

nology. Nothern said. Availability to the Hines

It's the same reason First Options of Chicago Inc. is using Marathon's technology to run an important trading application, said Brian Slattery,

First Options is a provider of clearance and execution services to traders on major U.S.

Unlike other high-availa bility techniques such as clus-tering, Marathon's approach doesn't allow for even a tem porary service disruption if a server goes down, Slattery

"That's critical for us. ... A fail-over of even a minute or two could cause his problems" when dealing with trading sp-"Marathon is the only ven

Clabby, an analyst at Aberdeen Group Inc. in Boston, referring to 99.999% uptime. The new ComputeThru technology in Marathon's tool kit can be used to tie more scalable and powerful dualprocessor Intel servers into similar configurations.

2 CORIO

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Microsoft

Xerox Unit Farms Out Security in \$20M Deal

Axent contract will pay for itself through savings from doing business online

rates at note, the Stamford, Conn. based Nero . Corp., has signed a five-year, \$20 million mancurity services with Axent Technologies Inc.

force and its digital business initiatives. Beginning this year with several thousand users. Rockville Md based Avent truether with its subsidiary Secure Network Consulting Inc., will create un electronic security framework and service agreement that is expected to serve up to 100,000 Xeroy customers and employees by mid-2002. Xerex Europe, which had revenue of \$5.3 billion last year and employs 18,500 people, is expected to save \$20 million per year using its purent company's eCommerce secure

to secure Xerox's mobile work

electronic trading environment. The Asent deal will enoble this me Increasing corporate initia-

tries for online commence sixtems - combined with recent and a shortage of trained security managers - has pushed the demand for outsourced se-

David Tapper up analyst at Framingham, Mass-based In ternational Data Corp. estimates that the market for security consulting should reach \$14.8 billion by 2003 up from

S6 2 billion last year. Security Is Part of Reinvention

Managed security is a key part of Xerox's plan to reinsent itself from an analog copper business to a digital document and information technology company, according to fim Lawler, senior director and general manager of Xpress. Xerox Europe's purchasing group. He said Asent's man aged security services are the cornerstone of Xerox's plans to move its mobile European workforce, its field service engineers and its business-emp

cal processes to the Internet.

value for the money as well as Xerox plans to integrate the Agent security services into its effrocurement and eCommetric initiatives, which the company said will improve

is create a seamless digital enstronment for customers, emplayers and suppliers" said Lowler "Avent offered the best

into the Nerox network. Lowler said Axent also offers a deeper understanding of Fig. ropean technical signaturate enterprise resource planning systems, encryption and privacy regulations essential for his business

dovetail those in industry pa

rameters and technical protocols. The system will extend from the customer's gateway

Outsourcing Trend Steve Hunt, an analyst at Giga Information Group Inc. in Park Ridge, III., said Axent is tomane the ranks of security product vendors who have recently announced that they will offer security services

BY KATHLEEN DIE SON Antivirus software vendors warned companies about onother e-mail view but wook this one nicknamed the Killer Résumé, but it appeared to have done little damage and was reportedly contained The virus, patterned on last

New Worm

Big Impact

Fails to Make

year's Melissa worm, went out on May 26. Like Melissa and the Killer Résumé worm spread through Microsoft Outlook as an e-mail message. Its subject line reads "Resume -Janet Simmons," and includes an attachment called *Re sumel.doc" or "Explorer doc". If a user opens the attachment the worm attempts to e-mail itself to the user's entire address list. It then attempts to delete files on the hard drive nace the attachment is closed.

Antivirus software vendors. including Symantec Corp., Trend Micro Inc., Computer Associates International Inc. and Network Associates Inc., warned that the worm was spreading through some corporate e-mail systems. Trend Micro in Cupertino, Calif., reported that it had infected as many as nine sites

However, the Computer

4.1 must apply a manual work-Emergency Response Team at around procedure, outlined at Carnegie Mellon University in Pittsburgh said it hadn't re-Cyber Patrol suftware is incriwed any infection reports. stalled by default as part of the Cupertino-based Symantee Gauntlet package, then is disand Santa Clara, Calif-based abled after 30 days, according Network Associates gave the to SecurityFocus.com, a Webrésume worm a medium-risk assessment because it didn't spread rapidly. Trend Micro No other applications used and CA in Islandia, N.Y., rated with Gauntlet are known to it as a high risk, though Trend Micro downgraded that to

medium later in the week Ira Winkler, president of the Internet Security Advisors Group in Severna Park, Md. said that the security community should talk more about how to stop viruses and worms. For example, users can prevent infection by disallowing macros and updating the definitions built into a user company's antivirus software he said &

customer service, exchange or-A Means to an End

\$20 million

Five years

· Electronically exchange or

ders from thousands of partners and automate manual lesticy processes. Avent will gather information about Xerox's business practices and inthrough outsourcing deals. Others include Internet Security Systems Inc., Network Associates Inc., Aventail Corp. and Counterpage Internet Security Inc., he said.

Network Associates' Web site.

based security clearinghouse

cause a similar problem, said

Dana Lengkeek, a Network As-

The default settings that in-

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part of the Gauntlet package

available patch files fix the

won't be changed because the

sociates spokeswoman.

problem, Taylor said. 9

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said. The problem was detected May 19 and a patch was re-It's available at www.pgp. com jump guuntlet advisory.

asp#patches

mediately to fix product flaws,

The patch supports Gauntlet for Univ Versions 4.2, 40 and 5.5. The patch also should be applied to Network Associates' WebShield 100 and 300 series products.

Users of Gauntlet for Unix

Jessed May 22

Eric Hemmindinger, an analyst at Aberdeen Group Inc. in Boston, said that because the company worked quickly to identify and create a patch for the security hole, it won't be much of a problem for Gauntlet users, "We

usually view that as a good thing" when a company responds im-

OREONLINE For books, articles, papers and other annurses about Fremails, with our Web title re computerwork! comboos

Network Associates Firewall Vulnerability occurs

Security Hole Patched in

with dual tool use

87 TODO R. WEISS.

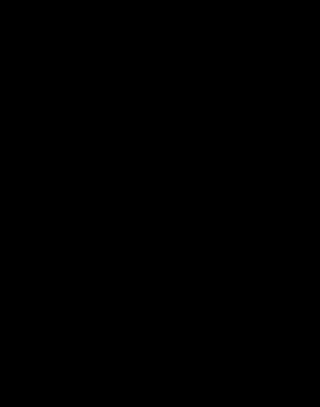
Unix users of Network Associates Inc.'s Gauntlet firewall software are being advised to install a patch to protect their that leaves them vulnerable to

The security hole occurs when Gauntlet is used with Cyber Patrol software from El Segundo, Calif-based Mattel Inc. The combination of the two applications causes a ty," which creates an entryway for attacks on the network Santa Clara, Calif-based Network Associates said in its ad-

Allison Taylor, a spokeswoman at the company's PGP Security division which makes Gauntlet, refused to say how many customers use the program. But she did say no

problems were reported due to "We've been munitoring our newsproups and our support

lines and [customer concerns were] very minimal," Taylor



Xerox Unit Farms Out Security in \$20M Deal

Axent contract will pay for itself through savings from doing business online

EROX EUROPE, the European arm of Stamford, Conn.based Xerox Corp., has signed a five-year, \$20 million managed security services contract with Axent Technologies Inc. to secure Xerox's mobile workforce and its digital business

initiatives Beginning this year with several thousand users, Rockville, Md.-based Axent, topether with its subsidiary Secure Network Consulting Inc., will framework and service agreement that is expected to serve up to 100,000 Xerox customers and employees by mid-2002. Xerox Europe, which had revenue of \$5.3 billion last year

and employs 18,500 people, is expected to save \$20 million per year using its parent company's eCommerce secure electronic trading environment. The Axent deal will en-

able this use. Increasing corporate initia-

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attacks on e-commerce sites and a shortage of trained security managers - has pushed the demand for outsourced secarity services David Tapper, an analyst at Framingham, Mass-based International Data Corp., estimates that the market for security consulting should reach

\$14.8 billion by 2003, up from \$6.2 billion last year. Security Is Part of Reinve

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robustness of environment. Axent security services into its eProcurement and eCommerce initiatives, which the company said will improve customer service, exchange or-

Duration

What Xerox is trying to do

Xerox plans to integrate the

is create a seamless digital eovironment for customers, employers and suppliers," said Lawler, "Axeot offered the best value for the money as well as

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Business goals it will help Xerox accomplis

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Others include Internet Security Systems Inc., Network Associates Inc., Aventail Corp. and Counterpane Internet Security Inc. he said &

through outsourcing deals formation management and

cal processes to the Internet. Security Hole Patched in **Network Associates Firewall**

Vulnerability occurs with dual tool use

AY TODO R. WEISS

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how many customers use the program. But she did say no problems were reported due to the security hole. "We've been monitoring our

newsgroups and our support lines and foustomer concerns were] very minimal," Taylor said. The problem was detected May 19 and a patch was released May 22 It's available at www.pgp. com/jump/gauntlet_advisory.

Eric Hemmindinger, an analyst at Aberdeen Group Inc. in Boston, said that because the company worked quickly to identify and create a patch for the security bole, it won't be much of a problem for Gauntlet users. "We

usually view that as a good thing" wheo a company responds immediately to fix product flaws,

The patch supports Gauntlet for Unix Versions 4.2, 5.0 and 5.5. The patch also should be applied to Network Associates' WebShield 100 and 300 series

products. Users of Gauntlet for Unix 4.1 must apply a manual workaround procedure, outlined at Network Associates' Web site. Cyber Patrol software is installed by default as part of the ntlet package, then is disabled after 30 days, according to SecurityFocus.com, a Web-

based security clearinghouse that first reported the bole. No other applications used with Gauntlet are known to cause a similar problem, said Dana Lengkeek, a Network Associates spokeswoman. The default settings that in-

stall the Cyber Patrol trial as part of the Gauntlet package won't be changed because the available patch files fix the problem, Taylor said. 0

New Worm Fails to Make **Big Impact**

Antivirus software vendors warned companies about another e-mail virus last week this one nicknamed the Killer Résumé, but it appeared to have done little damage and was reportedly contained. The virus, patterned on last

year's Melissa worm, went out on May 26. Like Melissa and last month's I Love You virus, the Killer Résumé worm spread through Microsoft Outlook as an e-mail message. Its subject line reads "Resume -Janet Simmons," and includes an attachment called "Resumel doc" or "Emlorer doc" If a user opens the attaches the worm attempts to e-mail itself to the user's entire address list. It then attempts to delete files on the hard drive once the attachment is closed. Antivirus software ven

including Symantee Corp., Trend Micro Inc., Computer Associates International Inc. and Network Associates Inc. warned that the worm was spreading through some corporate e-mail systems. Trend Micro in Cupertino, Calif, reported that it had infected as many as nine sites

However, the Comp Emergency Response Team at Carnegie Mellon University in Pittsburgh said it hadn't received any infection reports. Cupertino-based Symans and Santa Clara, Calif-based Network Associates gave the résumé worm a medium-risk

assessment because it didn't spread rapidly. Trend Micro and CA in Islandia, N.Y., rated it as a high risk, though Trend Micro downgraded that to medium later in the week. Ira Winkler, president of the

Internet Security Advisors Group in Severna Park, Md., said that the security community should talk more about how to stop viruses and worms. For example, users can prevent infection by disallowing mocros and updating the definitions built into a user company's antivirus software, he said. 9

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Digital Signature Bill Inches Closer to Vote

ITAA supports proposal, but consumer group calls for more protection; report not yet released

er Partick Timbods au
ONG-STALILID BIGITAL signature legislation may be
moving closer to a vote
in Congress. A conference
committee report, intended
to reconcile differences between the
House and Senate versions of the bill,
now has the backing of amajority of the
conference committee's members, sereral sources familias with the process

said last week.
However, the report still hasn't been finalized and publicly released.
The Information Technology Associ-

ation of America (ITAA), an Arlington, Va.-based trade association, last week called on lawmakers to pass a digital signature bill and said the conference committee report contains the major elements it wants to see in the bill.

Debate Continues

The proposed compromise would put electronic signatures on a legal par with written ones, would preempt state digital signature laws to keep a patchwork of different rules from developing and is technically neutral because it doesn't favor any single form

David Colton, a program manager at the ITAA.

The legislation has also received much attention from the financial services industry, which wants to be able to to issue mortgages and loans online. But the use of electronic signatures to authenticate financial contracts has raised consumer-protection issuestomey at the Washington office of the National Consumer Law Center and a prominent critic of the digital signature legislation, said the conference committee's bill still doesn't offer the protection she would like. "We're disappointed it's not better, "We're disappointed it's not better,

"We're disappointed it's not better, but we're happy it's not worse," she said.

Any report issued by the conference committee must still get approval from the full House and Senate. The report will also have to pass muster with the Clinton administration, which has been critical of the

legislation in the past.

EU Overwhelmingly Approves U.S. Data-Privacy Regulations

Should make conducting business in Europe easier

DV BLIZABETH DE BOBY
The U.S. last week became the first
country outside of the European Union
(EU) to receive recognision that its
rules for protecting data privacy meet
the requirements of EU member states.
U.S. government officials said this
step should help ensure that American
companies don't have problems conducting business in Europe.
[Ionathan Todd. a European Commis-

sion spokesman, said at a daily EU news briefling that the Western European organization's IS members had "overwhelmingly approved" the provisions of a safe-harbor agreement acknowledging the adequacy of U.S. data-protection rules.

The vote, which was taken during a

meeting of the EU's Article 31 Committee on data privacy, follows an earlier recommendation by the European Commission that the agreement be approved.

The agreement was negotiated by

The agreement was negotiated by U.S. and European officials in response to a 1998 commission directive that prohibits the transfer of personal data to non-EU countries that don't provide adequate privacy safeguards.

E-Commerce Aid The agreement clears the way for

U.S.-based companies that adhere to the safe-harbor principles to continue receiving information from databases maintained in Europe.

The European Parliament still has to review the agreement before it is formally adopted, but only the Article 31

Committee could have overturned an earlier favorable recommendation that was issued by the European Commission. The entire approval process should be completed by early next month. Todd said.

Although there were some concerns about the outcome of the Article 3l Committee's vote, EU and U.S. officials downplayed the risks that opposition from certain members — notably Italy, Austria and Spain — would block approval.

Decision Applauded

In a statement, U.S. Secretary of Commerce William M Daley halled the U.Committee's vote as "a landmark accord for e-commerce" transactions between the U.S. and Europe. Without the safe-harbor agreement, U.S.-based companies also "would find it difficult to run multinational operations," because basic information about European employees coaldn't be transferred here. Daley adder.

The safe-harbor rules cover all industry sectors and virtually all forms of personal data, according to Daley's statement. Compliance by U.S. compa-

The White House also released a statement about the vote, spring it will prevent the potential disruption of about \$2.00 billion in trade between the U.S. and Europe. Smillar classifications for non-EU members Switzerland and Hungary are expected to follow before year's end, according to the European Commission. But recognition of Japanese and Australian data-privacy regulations may take loomer to approve.

De Bony writes for the IDG News Service

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Sun Claim Against dicrosoft Dismissed

rict Court Judge Rr

Regional Bell Adds Online Uporades

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Analysts: Stormy Days Ahead for Tech IPOs

Market cooling off after hot first quarter

OV MARIA TROMS

TER INITIAL public offering (IPO) values dropping like hailstone: In a summer thunderstorm it was no surprise last week when handheld device maker Handspring Inc. lowered its IPO share pricing for the sec-

and time in two months Other companies are retreating from the public market. Two dozen companies pulled their IPOs last month more than in January, February and March combined, according to New York-based research firm IPO.com Inc. But there's no reason to think that the IPO decline and the sharp drop-off in the

money IPOs raise - will conse significant problems for U.S. technology development. For example, the story behind Mountain View, Calif.-

a semior analyst at Internations al Data Corp. in Framingham. Mass., said that rather than reacting to a poor IPO reception, the company appears to be

offering its stock at more modest prices to bring in investors. Equally important for U.S. technology users, venture capitalists will continue to invest in

	NUMBER OF COMPANIES	
OI 2000	1.557	\$22,684
Q4 1999	1,546	\$21,021
Q31999	1,264	\$13,004
Q2 1999	1,115	\$10,554

new companies, even without the hope of an immediate IPO jackpot, said Jeanne Lazarus, a spokeswoman for the National based Handspring's action was Venture Capital Association not necessarily bad. fill House.

term investors," she said, "But

there is a sense right now to

maybe hold on to an investment

a little longer [to] make sure it's

mature enough and developed

enough to handle a turbulent

Computer and communica-

tions companies remain the

most attractive to venture capi-

talists, according to an NVCA

report, with computer compa-

nies receiving \$12.4 billion and

IPO market environment."

to more scrutiny than they were a few months ago," be said. "But the good deals and the good ideas that come out of the scrutiny continue to get funded. There are lots of folks talking about directing resources to infrastructure, and that's a trend that's likely to continue. Venture capitalists have tra-

pect the technology ventu capital pipeline to be affected by market volatility. "All deals are now subjected

ditionally been more interested in infrastructure than in retail. said Jesse Reyes, vice president of Newark, N.J.-based venture capital research firm Venture Economics. Last year's mania for e-commerce firms was an aberration, he said.

"Now it's moving back upstream to more of the technolour facilitation and infrastructure rather than the content at the other end of the pipeline. It's a move toward something they're a lot more comfortable with," Reves said.

Meanwhile, venture capitallsts continue to make profits from key investments. For example, Handspring's amended filing with the Securities and Exchange Commission said in will raise \$190 million before expenses by selling 10 million shares - a mere 8% stake in

communications companies re ceiving \$6.02 billion this quarter from venture capitalists. Mark Opel, chief operat the company - giving signifiofficer at Capital.com Inc. in cant returns to venture capital (NVCA) in Arlington, Va. New York, said he doesn't ex-

Lucent Buy Marks All-Optical Network Move

Carriers now vving for market positions

Murray Hill, N.J.-based Lucent Technologies Inc. agreed last week to purchase Chromatis Nerworks Inc. in a stock deal worth an estimated \$4.5 billion. The purchase is part of Lucent's efforts to stay competitive in the burgeoning all-optical carrier market, said analyst Jim Slaby at Giga Information Group Inc. in Cambridge, Mass. Herndon, Va.-based Chroma-

tis has yet to release a product but has developed a fiber-optic system called Metropolis that can transfer voice, video and data on a metropolitan network. According to Slaby, the gen-

erosity of the deal is an indication that the technology is topnotch. "They're looking at the best technology here, not necessarily who's got the best market share," he said.

Chromatis' Metropolis represents a mission link in Lucent's optical network, Slaby said. Metropolis speeds up the transfer of data packets, voice and video by sending them through the bandwidth simultaneously at different wavelengths. The technology, known as

dense wave division multiplexing (DWDM), helps companies save money by avoiding the need to install more fiber-optic equipment, by streamlining the information that can be sent through the existing network.

That capability is the impe tus of the deal. Metropolis will

core fiber-optic networks to its internal networks, said Lucent

spokesman Ray Zarde "This is a huge, kind-of-uncharted territory. The projec-



tions for this market are all enormous," Slaby said, "This is a huge, big-stakes game.

PaineWebber Inc. in New York estimates that the market for DWDM systems will grow from nearly zero last year to just over \$2 billion in sales in 2003. And the major players in the market, including Lucent. Nortel Networks Corp. and Cisco Systems Inc., are invest-

ing a lot of money in all-optical networks. Close to one-third of those firms' acquisitions and money spent during the past year was for all-optical network technol-ogy. Slaby said, "Everyone is hurrying to fill out their prod-

uct lines," he noted So for Lucent has invested the most for a DWDM company. Nortel paid \$300 million for Cambrian Systems Corp. in Kanata, Ontario, and Cisco spent \$800 million for Qeyton Systems AB in Stockholm.

They will all hit your Web site at once. They won't wait patiently for service. And one of them intends to hack their way into your system.

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Seize the data

F THE WRITING ON THE WALL in Washington gets much bigger, Uncle Sam will need to start renting billboards on Pennsylvania Avenue to display it all. The government is clearly unimpressed with the high-tech industry's self-serving arguments that it can self-regulate to protect online consumer privacy. No

surprise that politicians are buzzing around this issue like

wasps on cotton candy The FTC recently weighed in [*Privacy Concerns Rankle Industry," Page One, May 291 with a harsh assessment of the toothless privacy policies posted on so many popular Web sites today Paired with that story was one describing a wireless technology that essentially spies on which stations car radios are tuned to and feeds

that data back to advertisers. Yet another story ["Database Key in Airline Merger"] noted how a compelling reason behind the proposed merger of United and US Airways is the consolidation of two of the largest customer databases in the travel industry.

Politics aside, it's all about the customer data. Every company with a substantive on-line presence is collecting terabytes worth of "clickstream" data, and most of them, frankly, don't have a clue what to do with it yet. The latest technological Holy Grail is integrating this new source of online data with back-office business systems and front-office customer prospecting software. The smarter your data - the better you connect those e-customer dots the more profitable the picture becomes. That's why business intelligence software - everything from Web site data analysis to CRM systems - is booming

What's missing from this emerging scenario is the voice of IT leadership. In the good old glasshouse days, technology departments were the chief data collectors. Then the PC revolution derailed that duty and handed it off to end users. In this new online century, the pendulum is swing-

ing back with a vengeance. It's time for IT to seize the data back again. Not just its care and feeding, but the strategic thinking around what your companies actually do with it. Make everything that supports and surrounds customer data your business. Make it the most critical focus of IT. Make sure the CEO understands the consequences of who sees what data and why.

Don't wait to read all about it on Uncle



THERE'S NO MONET IN PRIVACY, JERRY, "

DICK HUDSON

Will GE hand CEO reins to a 'tech-age' leader?

S IT POSSIBLE THAT A TECHIE could be the heir apparent to the legendary Jack Welch as CEO of General Electric?

The cover of a recent issue of Fortune magazine has Scott McNealy, CEO of Sun Microsystems, hugging Welch. It's accompanied inside by an article detailing their "best bud" rela tionship. When asked by Fortune if McNealy

would be his successor. Welch declined to comment At GF's recent and al shareholders' meeting, Welch assured the media

that his successor (Welch plans to retire by the end of the year) would be an insidez, McNealy sits on GE's board of directors At first blush, a Technology Age ploneer would

be a least-likely candidate to run one of the world's largest Industrial Age icons. But given Welch's total commitment to the Internet and his creation of a technology-mentoring program for GE executives conducted by tech-savvy twentyand thirtysomethings, it makes perfect sense,

Welch's final legacy could be his most enduring: positioning GE to be a global leader in business-to-business e-commerce. GE isn't one of the world's most admired and talented companies without reason, and if McNealy becomes the next

CEO, it will be a real coup. By the end of this decade, most top-level senior executives must be more than just acquainted with computer technology, and GE's mentoring program is giving unusually early exposure to senior management for the company's next geogra-

tion of executives. These e-commerce and tech-savvy 20- and 30year-olds will embrace the brave new world wholeheartedly, and GE must do so, too, or the company's famed talent pool will dry up. The next CEO must be a believer and disciple of the Technology Age. McNealy is such a CEO and would bring world-class smarts and Technical Age credi-

bility for this venerable Industrial Age giant. The effect of this appointment would be to shake up the orderly universe of the traditional brick-and-mortar outfits. Such a departure from mainline thinking would signal a significant psychological shift in succession planning and bring outcries of derision from those of the old school.

Should they follow suit? Or sit on the sidelines and



NEWSOPINION

watch? They will have to address the future of their mainstream businesses in a new and unsettling light. The decision by one of the world's most respected and admired companies and its CEO can't be ignored or dismissed. I believe a large oumber of financial services, transportation and retailing companies will embrace the senior IT manager as a serious candidate for the CEO job. Regardless, if McNealy succeeds Welch, it will

be the management story of the past 10 years. DAN DRAKE

We may be partly to blame for the Microsoft mess

WONDER IF WE, as enterprise software buyers, aren't unwittingly responsible for the stifling of innovation for which Microsoft stands accused. We may think we're saving money, simplifying vendor relations and promoting integration, but we may be stifling innovation in the PC software market.

Two things make it difficult to compete in the PC software market today: software bundling, and



operating-system veodors that give their application developers the documentation on applicatioo programming interfaces (API) before they give them to competitors' developers.

We buy software in bundles such as suites because it's cheaper than buying products individually, it reduces the number of vendors we have to deal with, and we may feel that

we get better integration. But I take exception with the assumption that you have to buy all your software from the same vendor to get products that work well together. Look under the hood of a car and you'll probably find an assortment of components from different man-ufacturers working in harmony. Software products from different manufacturers can do the same.

But by buying our software in bundles, we create two problems for innovators. First, we thwart the basic free-enterprise principle of "survival of the fittest." Second, we make it almost impossible for vendors that doo't have a full suite of products to compete with those that do.

There are several reasons that the "fittest" software product may not prevail in a free-eoterprise system: poor management, poor marketing and poor advertising are a few. But wheo we select a bundle of products to save money, rather than evaluate individual products and select the best in each category, we may also keep the "fittest"

products from prevailing. We send a message to the vendor that we're more concerned about a product's price than its quality or functionality. We also circumvent a process intended to weed out inferior products.

When we buy in bundles, we also impose a burden on vendors that doo't offer a full suite of products. We force these vendors to choose: Should they use their limited resources to develop or acquire products that would make a com-petitive bundle? Should they try to compete on the merits of their individual products? Or should

they not even try to bring an innovative product to market because they know they can't compete? We can also stifle innovation if we buy products from an operating system vendor that gives its API documentation to its application developers before competitors' developers, instead of waiting for these competitors to exploit the new APIs. Better yet, we could pressure the operating system vendor to provide API documentation to

competitors simultaneously. This would give them a fair chance to compete and innovate. Since start-ups can't compete fairly in the PC

Online, May 2617

This is a very cool le

gal platform from which

to deflect stealth access

to my computer by Web

oo-trespassing right?

Berrien Springs, Mich.

Encerch propaganda

FOUR REPORTING

propaganda seems

leen Melymuka's ar-

to be getting worse, based

ticle "From Straw to Gold — and Back to Straw"

[Ms. MISI is very service

on your May 15 issue

of biased feminist

Intechnik Inc.

software market, they and their investors have migrated to other markets. (For example, Inprise/Borland, whose Quattro Pro and Parador competed with Excel and Access, now concentrates on Internet infrastructure software on Linux, Solaris and Windows 2000.) How can we make sure we don't make the same mistakes and stifle innovation in those markets? And is there anything we can do to revive innovatioo in the PC

software market? I have four suggestions:

 Begin by getting management's commitment to buy the most cost-effective products in each

Form pilot groups to test and measure which products in each category are most productive and cost-effective.

Let software vendors know how you plan to choose products. Let platform vendors know you won't buy from them if they don't provide timely API documen-

tation to competitors. All this should encourage survival of the fittest and innovation.

Easy target, indeed? | Keep away from my NOMINATE Jaikumar

Vijayan to receive the understatement award for the headline on his May 15 front-page article, "Windows Easy Hacker Target." twork administral Perry Totach Inc.

Juniter Fla IMME A FREAKI The renowned user-friendliness - and popularity - of Windows software" to which you alluded strikes me as blatant pandering. I don't find Windows or

its software particularly user-friendly; either Windows crashes or I have to reboot at least three times a day As for popularity:

There's no alternative to Castro in Cuba, but that doesn't make him popu lar. Windows is a user hostile, technically inferior graphical-interface

virus. Now that it's an rasy hacker target," it has become a rem access virus as well. No wonder your calls to Microsoft weren't returned.

griping with no substance, cookies, or else the blacant discrimination

OES THE CRAY Claiming stereotypical Court win mean the cookies in my attributes for women (women are holistic, nurcomputer are personal turing, known for valuing property and I can do. relationships, etc.) is pre-cisely the kind of sexism and that Web sites not go there, let alone re-Ms. Melymuka is pretrieve information from sumably against. If you them about me without are going to do that, then my prior approval ("Fed-eral Judge Blocks Web Bot From Tapping Into you should also be talking about men's ambition, objectivity, technical eBay," Computerworld

prowess, "no excuse, sire" dedication to suc cess, etc. in comparison The article "Gloss Ceiling for Women in IT Persists" [News] is delib sites I may visit. My only erately trying to create a question is. Who is going to help me enforce this biased picture by quoting selected individual sta tistics in inflammatory,

sensationalist ways. The article says nothing at all meaningful or spiritually truthful Preston McHe Blue Bell Pa

Cyberstores would benefit from feetback

A cret shopper," I rnjoyed your article on e-commerce site feedback from the cus-

tomer's point of view [*Constructive Web Critics," Business, May

22] Apparently, Web site designers are just as likely to be clueless about customers' opinions as their brick-and-mortar

The big difference I see is that in a store, you can bend the ear of whoever is in charge. This is not always so easy at a

Many sites didn't offer an online feedback feature - or even an e-mail address for comments This simple step might give them valuable feed back without the need for insights from paid

More Letters, page 38

COMPUTERWORLD welcom words and should be addre to James Eckle, letters edit Computerworld, PO Box 9171 500 Old Connecticut Path, Framingham, Mass. 01701. Fex: (506) 879-4843, Internet

What is Windows 2000 Advantage? Windows 2000 Adventage is the partnership among Microsoft, Compan and Computerworld Enterprise Susiness Solutions to m IT leaders about Windows NT and Windows 2000 technology by providing timely, useful information — in print and online - for planning and deploying Windows NT and Windows 2000 with Congress services and solutions.

Online This Week

Debunking Windows 2000 Myths

Understanding the Active Directory Physical Structure

Richard Fade talks about the Compag-Microsoft relationship





Microsoft

Windows 2000

Kerberos explained

By Mark Walla

Although this article is billed as a primer to Kerberos authentication, it is a highly technical review. Kerberos is an integral part of Windows 2000 Active Directory implementations, and anyone planning to deploy and maintain a Windows 2000 enterprise must have a working knowledge of the principles and administrative issues involved in this front-line security technology.

Since many other operating system vendors are also adopting this MIT-developed authentication protocol, Kerberos Version 5 will increasingly become a centerpiece of enterprise-level interoperability. Kerberos provides

secure user authentication with an industry standard that permits interoperabili tv. The Active Directory domein controller meinteins user eccount and log-in information to sup

port the Kerberos service The process of authenti cating the identity of users during log-in is the first stop in geining system access. For local machines that aren't ectively participating in a

domain, Windows NT LAN Manager protocol is still utilized to verify a user's name end password before granting system occess, However, In domain environments Microsoft has coupled Active Directory closely with Kerberos. Once eccess is granted, ticl that permit specific access to other system resou



within the domein are Kerberes 101 **Underlying Windows 2000** security is the concept of user euthentication. The

centrelized eccount menegement suppor by Active Directory Services requires a corresponding euthentication protocol for network logon. Besed on RFC 1510, the Kerberos Version 5

protocol provides enhanced authentication for the distributed computing environment and standardization to intercoerate with other operating systems.

For the full text of story, visit www.Windows2000-



ADVANTAGE

▶ Feature

Compaq Intelligent Manageability tools make life easy for PC users

By Elisabeth Putnam All over the world, technical support people are faced ; with the onerous task of installing, configuring and updating PC desistop soft ware. Often, they must do it for hundreds or thousands of users at a time. This happens when a company acquires a new division, adds multiple seas sites or decides to migrate to a more powerful hardware platform.

Done manually, the process takes between two and three hours per desidop. So it's no wonder that information technology support personnel would love to outsource the job - or at least automate

large pieces of it. Now they can, thanks to some crucial additions Compag Computer Corp. has speedilly product family

About a year ago, Compaq introduced Ineight Manager Light Console (LC), a Web-Insight Manager XE. Like its big brother, LC tracks assets and collects pre-tail hardware skorts south as manifembe wns or bad memory sectors, However, LC was designed to manage up to 200

desidons Insight Manager LC also automatically updates a PC's hardware configuration to match a predefined set of driv-



er and BIOS specifications. says Ed Reynolds, director of PC Lifecycle Solutions at Compag. The platform can manage any brand of PC hardware that supports the Desktop Management Interface. It can also perform auto-

mated updates of basic soft-One of the early implementers of Insight Manager LC was First American Credco, a Santa Ana, Calif.-based company that sells specially credit reporting and informa-

tion management products to mortgage lenders in a variety of industries. The company now has LC clients installed on all 1,400 of its desistops. "LC allows us to proactively manage the desidop, notifying us if a case is open. If

there's a memory change, if there's an abnormality like a hard-drive arror," says Mike Ratermann, network support manager at the firm.

Insight Manager LC also collects Compaq hardware asset Information, which is then used to populate First American Credco's Microsoft Corp. Systems Management Server (SMS)

detabase, Ratermann says. "It collects things SMS doesn't, providing detail I couldn't have without buy ing a separate third-party package - memory chip sarial numbers, for instance."

Insight Manager LC proved to be a pivotal product for Compaq's Intelligent Manageability strategy. Raynolds says, # For the full text, visit Advantage.com

Point

www.Windows2000Advantage.com

NEWSOPINION

IOHN GANTZ

F-business skills shortage will eclipse IT gap

TE ALL KNOW ABOUT the current shortage of IT professionals, IDC's Michael Boyd calculates that this year, there will be a demand for 4.5 million FT professionals in the U.S. vs. a supply of 4.1 million.

Scary. But not as scary as an even bigger sbortage on the horizon: e-business professionals These are the people running the online companies and divisions that are

going to drive trillions of dollars of e-commerce over the next five years. They are online marketing executives, business planners and strategists, content creators, product line managers and so on. Some are even IT professionals. As part of a recent e-commerce forecast. I had to estimate the num

ber of individuals in-

volved in making those trillions happen. Some are IT professionals, covered in the Boyd numbers, and some are non-IT professionals employed by vendors. But most are professionals working in the e-businesses themselves. A small percentage of them work in dotcom companies, but a lot more work in brick-and-

mortar companies. The numbers don't look too bad today. I estinate that there was demand for less than 5 million e-business professionals last year, and most of that demand was filled. It may have been filled with kids under 30 years old or by executives drafted from off-line business units, but it was filled. But if e-commerce meets that multitrillion-dol-

lar prediction, the demand for e-business profes-sionals will grow to 20 million positions, making it bigger than the worldwide community of IT

Where will these people come from?

The two best sources will be enlightened individuals in off-line business units and IT professionals with the right personalities and attitudes. What does this mean for you?

If you're an IT professional with "crossover" aspirations, some business background or acumen and the right personality, you'll have much better opportunities. You can leave the IT profession and and become an e-business executive (and your IT background will belp).

But if you remain in IT, you will increasingly work hand-in-glove with e-business colleagues, many of whom will either be inexperienced in

business but big in the online stuff, or experienced in business but clueless in technology. We already see this dichotomy in the world of

Internet start-ups - the laboratory for tomorrow's Internet economy. There aren't enough people with both business and online experience, so we see companies hastily formed around business plans and populated by young people with little real-world experience and whatever wizened veterans the venture capitalists can find to give their investments a fighting chance.

Since a lot of tomorrow's e-business execs are likely to be draftees, the opportunity for IT professionals to have real impact on company strateev. product plans and sales will rise dramatically. When the business is e-business, the technologists have to be in on the ground floor and at the inception of the business. For many, this will be a heady experience. But it isn't risk-free. You'll be helping to make decisions that affect the future of your company, not just implementing the declsions of others. I bope you're up to the task.

BILL LABERIS

Congress: Stop giving the Internet special treatment

TAX THE INTERNET. Or more appropriately, stop treat-

ing the Internet as though it was some special class of citizen deserving the tax-exempt treatment usually reserved for churches, universities and charities. I say this as a staunch libertarian with a profound distaste for big government and a belief that we could run our public affairs with far fewer

taxes than we now collect. But in exempting Internet commerce from additional taxation, as Congress has overwhelmingly done (and is considering extending through 2006), we single out the Internet as some thing other than what it is, namely, a commercial venue just like a brickand-mortar mall.

Further, we place a clearly unfair burden on those least likely to trade

ing the tax burden on those who do trade on the Web, generally middle- and upper-income groups. But putting aside egalitarianism for a moment. let's look at the politics behind the current moratorium on additional federal, state or local taxes on Internet access or e-commerce

Two years ago. Congress authorized an Advisory Commission on Electronic Commerce to recommend some direction regarding Internet taxation. Comprising various state government officials as well as executives from AOL, AT&T. Gateway and others, the committee immediately split into protax and no-tax camps. In March, the mittee announced it lacked the two-thirds majority needed to make a formal recommenda-

tion to Congress. The stated reason for the Internet's status is that Congress wants to protect e-commerce from being strangled in its infancy by taxes, primarily state sales taxes. Most states with sales taxes have legitimate concerns about potentially beavy revenue losses, particularly when e-commerce rev-

enues are predicted to top \$1 trillion by 2003. Predictions such as those from venerable sources like IDC and Forrester Research don't have disclaimers like "provided e-commerce isn't taxed." The unbridled growth of e-commerce is a slam-dunk. Just ask any IT manager whose life has been unbraided by executive mandates to "move the business to the Internet." There's no proof that reasonable sales taxes will stunt that

growth in any way. Meanwhile, the feds say it's perfectly OK to continue taxing goods sold by brick-and-mortar establishments. Utah's governor, Michael Levitt, a member of the advisory committee, argued unsuccessfully to Congress that traditional con panies are being put in an untenable position when their online competitors can sell tax-free

and they cannot. Ask yourself this: Where are the low-income, the elderly and poor likely to shop today - at Wal-Mart or Walmart.com? And Congress wants which type of purchases to be tax-free for buyers? I don't blame the big IT companies that are lobbying for a tax-free Internet. But what about

Congress' motives? I believe its members are driven by three things First, they've always liked cozying up to cam paign contributors with very deep pockets, and certainly, the computer world is filled with them. Second, Congress likes to set industrial policy

rather than let free markets do so. Motivated more by political expedience, this has yielded protectionist policies that favored big steel in the 1950s and '60s, and light-truck makers even today. Now Congress wants to "protect" the Internet, as though it needs it.

Third, is it possible Congress wants to reserve any future taxation for itself rather than the states, believing Washington is better at allocating public funds? The Constitution allows Congress to overrule the states in certain matters of taxation, not unlike an Internet or e-commerce tax. In preventing states from recouping the increased tax revenue generated by the growth of e-commerce. Congress forces the states to either defer to other taxes (like income taxes), do without the additional revenue (a good lesson for Congress) or come groveling to Washington for

more money. Yes, tax the Internet, just like we would any other commerce medium. Failing to do so is elitist, destructive of other non-Internet businesses and just plain unfair.





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User uroun president and one Metal ink user defend Oracle's Web support system

A STHE executive vice president of International Oracle Users

Group Americas (IOUG-A) and a customer of Oracle Support Services (OSS), I would

like to comment on the May 15
support system, Oracle Meta-

Link, which Christine Mc-Geever wrote after attending a session with OSS management at the IOUG-A Live Conference ["Oracle Users Wary of its Web-based Support Plan, "News]. The article was good and pointed out some of the fears that people have in moving to online support. But I believe that those who use the online service to its fullest extent are extremely happy and use it as their primary resource. Other software companies would do well to

follow Oracle's lead.
Oracle MetaLink with Interoet Technical Assistance Request functionality is one of
the best services I've seen in
the world of customer support. Since its introduction
three years sgn, MetaLink has
continually improved. Users
expect online service for their
technical support needs and
have been requesting enhancements on MetaLink so
they can use the Web more
and more as they work with
support.

support. Metalink allows you to set up a personalized Web page so that you can keep track of technical assistance requests, bugs, see products and even your own support licenses and products at your company. Options like these are crucial improvements that use push technology to put the Oracle customer in courter of water than the sees and subsequently make his life easier.

From my conversations with OSS management, I expect Oracle customers will see even more improvements to OracleMetaLink. Rich Niemine

Chicago CEO, TUSC rich@tusc.com

A S AN Oracle database administrator with about seven years of experience. I have waited as long as two hours on the phone for Oracle technical support. In the last six months, I have been using Metal.Ink with very positive results. I've done everything from montechnical requests for software upgrades to asking fairly complicated

questions.

A very valuable feature of
MetaLink is the ability to
search the technical databases. I agree that phone support
should be an important part
of Oracle's technical support,
but if a lot of questions and
nonemergency problems can

HOW WILL YOUR IT STAFF SUPPORT THE INCREASING AMOUNT OF ENTERPRISE () TECHNOLOGY WITHIN YOUR ORGANIZATION ()



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Info Source ?....

more resources would be available at Oracle to quickly answer critical emergency Yaca Attwo

Yaca Attwood Chino Hills, Cald. Linux user grateful for

realistic perspective

THANK YOU, Mark Hall, for your realistic per-spective on the Linux market ["Unrest in Linux Land," News Opinion, May 151.

I too believe that Linux will get through this market test with flying colors. I base this on my daily use of the operating system and the applications that run so well on it. The small business owners that we deal with are in love with the price and perfor-

mance of Linux products.

More and more applications are being ported to Linux; potentially any Santa Cruz Operation product (with a clean code base) is a recompile away from a Linux version Alex Coker

Putting the blame on those who are no longer around

T'S COMMON knowledge at GE that the blame for any problems with a project will fall on the people who leave before its com-

Hence, it was no surprise to see that an earlier project team was blamed for the mis-steps in GE Aircraft Engines' e-commerce site ["The \$11 Billion Web Start-up,* Business, May 11.

It was very disappointing

that you reported it as fact. Your article made it sound as if a few new employees made a difference in imple-

menting the project. The article neglected to mention that the same maners who hired the new team to participated in the first project; they knew of and ap-proved that "unfocused" plan. Nor did it explain that most of the original project team (in-cluding me) left the company in frustration with a process that slowly grinds down any

Further, nowhere did the article mention the six months of inactivity in which the project team was repeatedly forced to submit financial impact statements of a yet-to-be-

designed Web site. Or the months-long delay in trying to schedule a meeting with the "blackbelts" and senior management. Or the two months when no work could be done

while purchasing negotiated with the vendor. What really changed during the two-plus years of the project was management's atti-tude. Only when Jack Welch

spoke of the need for e-com-merce in the business in 1999 did management decide to concentrate on the project.
Jeffrey Marks



Smithsonian Awards2000 Finalists

Business & Related Services

 Action Engine Corp. has diveloped a wroless Web application that activates the power of the Internet by completing multiple, complex Web transactions in less than a minute.

multiple, complex Web furnoactions in less than a minute.

The world's larged time processive person to begin multiply community, a Blay line., addit namity a fail million family or dispared to world markets.

Remenal Magle line, substrates access personative data and services steed on the internet and other networks by talking with a limited, interactive computer presentation.

**BLavel 3 Communications inc. his introduced the world's first upgradable international fiber-aptic network to be completely optimized for IP technology.

Real-time personalization software from NeetPerceptions line. Issuing the interests of consumers and matches from with products, realized primered shoppers proce efficient.
A in themset energistion system from Real/Reamess Corp. transports people dendely to branch on the Web and can be used in any language or character set to improve a conquery, when no advertising investments by unifying its detection procedures.

Education & Academia

Il Though Computer Commission Comp. A CCC Destricts on company, Inching to Section of an obligation for bearing on company, Inching to Section of an obligation for the section of the Company of the Com

Environment, Energy & Agriculture

EINTUBERIL, CIRTY & AGRICULE

a Officers of the Department of Primary Industry and
Phanetean in Austrial's Norther Intertory are expend with
6PS increases to report the growth patterns of nazous woods,
growting the basis for weed cortest strateges.

Dates Emergy Morth America's online interest delivery

Dubus Energy Morth America's online intrant delivery of pricing, cost and power-supply data supports electric power marketers in making bids to supply power to a wholesale marlest, ensuring that consumers receive maximum value for their test.

net, enabling flow story, page 4(2).

Startus data from nearly 10,000 points in gas and electricity distribution networks at Hilmote Power Co. Tows into a control center every live seconds, insuring immodate and effective responses to unexpected shaptons.

Continued on page 42



The Computerworld Smithsonian As of their business's potential, gain a co

Pushing

SPECIAL REPORT SMITHSONIAN

AMERICAONE

CAD System Puts Wind In Cup Challenger's Sails

An America's Cup challenge is very secretive, and design is critical. Competitors hold off on building their boasts for as long as possible to first consider every possible design and innovation. "An extraordinary sailor in a slow boat will rarely beat an ordinary sailor in a slow for a boat will arrely beat an ordinary sailor in a fast boat." says 806 Billingham, chief operating officer of AmericaOne.

Unlike other development projects, however, the headilise never slips. The product has no be delivered in a finite amount of time and with one primary purpose: to wis the most prestigious rate in boating history. "It's an aerodynamic and hydrodynamic problem," asys Robert Flook, still designer for AmericaOne. "It's like building an airplame that is half underwater and half above."

us half underwater and all allowe."

Ding San Rafel, Calif.-based Autodesk Inc.'s

Auto-CAD and Volos View Internet collaboration

tools, AmericaChe's 40 naval architects, fluid dynamists, research scientists and structural analysts

were able to share drawings and concepts in real

time with the crew and builders who were scat
tered from California to New Zealand. "Technology

changes the competitiveness of the race," says

Gins Voo Emarch, marketing director for

AmericaOne. "The ability to collaborate from any location, using the Internet: means that you doo't just get the best engineers and designers in the area — you get the best in the world."

area — you get the best in the world.

Before CAD, the AmericaO edesign team could examine only six designs per campaign. Team members had to be assembled in one location or receive information via mail or fax. The phone offered the only real-time collaboration among remote team members but left the door open for incomplete or misunderstood conversations.

Typically, bout design is a serial process, satting with a hall mode, then the leed and finally the sail, with very little communication among the different design team. Unling modeling and collaboration to took however, the America/Dae team was able to integrate its design reflorts and consider thousands of alternatives. Design changes such as any other control of the control o

The 2000 America's Cup, which was held off the coast of Auckland, New Zealand, in January and February, was a closely contested race. America-One lost to the Italian Prada Challenge team's Luna Rossa by seconds. Team New Zealand ultimately won the Cup.

Looking back, the U.S. team reflects oo what it accomplished in an astonishingly short time. The project was driven by passion — with major team members donating their time and expertise for the chance to regain a title and national pride. Technology and the Internet have changed competitive boating and the perception of you'th racing.

With the help of the Internet, we caught America's attention, "Voo Emmerh says."

ogyto ovaloro the limi

vards 2000 finalists use technology to explore the limits mpetitive edge and, in one case, keep democracy alive.

the Envelope

Smithsonian Awards2000 **Finalists**

Continued from page 40

In the U.K. the Royal Society for the Protection of Birds' Merin Conservation System supports rapid analysis of the impact of development on birds, hobitats

and sites important for wildlife, helping to preserve the notural hentage for future generate Dynamic generation of Web pages through the Aerobiological Network of Galicia gives citizens access to the latest environmental data, providing particular ben-

Finance, Insurance & Real Estate

Large Value Transfer System, participating financial institutions can send secure payments in Canadian dollars across the country virtually instantaneously, with codence that the funds are good (see story, page 45) Modical referrals are shared over the internet in real time among doctors, specialists and medical suppliers us

ing for Health Alliance Plan's Internet Healthcare Coordination, giving patients fast access to medical services and virtually elemenating the referral process. Red time analysis software, Manday Stock Ma tec.'s Surveillance Delivery Real-time System, inspects

each of 6 million transactions per day and within two seconds alerts analysis of any that are unusual arctection the market's integrity and maintaining a level playing field for envestors

 The Nationwide Building Society's re-recognition program offers the first use of iris recognition in a specially equipped bank branch, allowing more than 98% ctions to be completed without a personal

identification number. Smart-card technology from Proton World Interonal offers consumers electronic curses, a secure nent and fast means of making payments in shops. at machines, and over the internet

Government & onorofit Organizations

South Africa's use of geographic eformation system technology that's accurate to within 2 meters determine voting districts and drave one of the world's most highly

elections to a fair and free result (see story the **The Library of Congress* National Digital Library/American Memory Project is a 60-terabyte (TB) database that supports Internet availability of millions of rare documents of U.S. history in an easy-to-use site.

A multilanguage computer learning system. Reactive Acquisition of Vocabulary Elements from Rayel Training LLC can understand and speak in multi languages to help students three in environments of

Intiguage to respect to make a mine and a make language dominance.

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· Electronic postage from the U.S. Pos

we really didn't ha Energy's Muzzay Nixe

Intranet Enables More Competitive Energy **Bids for Wholesalers**

N THE ELECTRIC-UTILITY WORLD, deregulation has forced business and technology managers to innovate and find ways to compete as they

never have before, observers say. In this environment, information technoloopers such as Brad Black at Duke Energy North America in Charlotte, N.C., are like kids with new tows in a sandbox

Duke built its own Real Time Performance Cost Monitoring System a year ago to provide quick information for bids on power to the wholesale energy market. Black and his team set up a Java-based thin client system, keeping intelligence on servers and allowing access from a variety of devices located anywhere on the company's intranet. Devices used to monitor information from plants or offices could be

PCs, laptops, smart phones - or even toys "We couldn't wait until we installed a Seva Dreamcast as one of the Web browsers, and it works great. We got probably the 10th one that Sega made, we wanted is so much," says Black, manager of technical projects. "It was easier to set up the Dreamcast than the Qualcomm PDQ phone."

Black specifically chose Sega of America Inc.'s Dreamcast browser to show that any device, even a toy, could be used to access the pricing, cost and power-supply data from any of 10 plants nationwid and, soon, dozens of others. Allowing flexibility with end-user devices will matter, as Duke partners with a variety of companies to produce and sell power. Black and Murray Nixon, the project's business manager, say the \$200,000 monitoring system has al-

ready paid for itself. But Black says it's impossible to measure how much of a business advantage the tool will give \$17 billion Duke, as it adds plants nationally obally during the coming years. The system shows bidders, plant ma

corporate asset managers a snapshot of the production capability of all plants throughout each day. It separates out the production needed for existing clients, allowing bidders and others to see what capacity is left for bidding on the open market. Armed with this data, bidders can set a price for wholesale energy in markets controlled by energy aggregators shipping power to an area where demand is high from an area where production capacity is available. "In the past, we really didn't have a feel for what

ower was available and if it was the cheapest power." Nixon says. Experts say the hig utilities will use such systems

to try to sell into high-demand markets. One such marker was the Northeast U.S., which faced a bot spell in early May at the same time many power plants in that area were down for maintenance During that heat wave, power was selling in the Northeast for \$6,000 per megawatt hour, compared with only \$300 per megawatt hour in the Midwest on the same day, Black says. "Clearly, many utilities want to be ... at the high end for the profits," he says. Black and Nixon believe their monitoring system has resulted in lower energy costs in homes and esses, but they can't quantify by how much

The Duke innovation shows that the traditionally vative utility industry is moving more aggresively, prompted by competition, analysts say. "Their project shows that the interesting developments don't involve the electricity commodity but the in formation that one can glean from it," says Ethan Cohen, an analyst at Aberdeen Group Inc. in Boston

GIS Technology Builds Infrastructure to Aid **Fair, Fast Elections**

HINK BACK TO THAT LAST big IT project you worked on. Remember the number of endless details and people to coordinate, the scope creep and, worse, how it seemed as if every officer in the company was watching? Just imagine the pressure if the whole world had been watchir

Well, last year, the whole world was watching Mandla Mchunu, chief electoral officer, and his in formation technology team at the Independent Electoral Commission of South Africa (IEC). And their project was daunting. In 1997, Mchunu was charged with ensuring that South Africa's second postapartheid elections were democratic, fair and fast.

It "was clear from the onset," Mchunu says, "that we needed to use technology as an integral part of

He and his team also had less than one year to plan and implement the project and deliver the elections.

It sounds like a recipe for failure. Worldwide experts said the data collection would take three to five years. South Africa's 1999 population of 43,426,386 was nearly three times that of Florida. Some citizens didn't have permanent addresses and were unable to read or write. There was no infrastructure in place to dependably gather and transmit electoral data. Plus, there was heightened publicity and intense political

But failure, says Mchanu, "was not an option." Any failure in the delivery of a sound election, he added. would affect the perceived health of South Africa's democracy, affect its economy and have implications for the country's status as a role model for the region. Besides, the international scrutiny of the elections wasn't focused on "who was elected" but on

"bow they were elected," Mchunu notes. The technology the team chose to implement as the backbone of the electoral process was a geographic information system (GIS) because, Mchunu points out, "key to the success of the elections was the compilation of an accurate voters' roll." The team created a customized, continuous snatial database with electronic maps of the country, accurate to 2 meters in urban areas. This information, overlaid with 1994 census information, determined the 14,500 voting districts, based on many spatial and demo graphic parameters, where people would first be registered and then could vote. "At the peak of the process, we recorded 44 million transactions to our

database in a 24-hour period," Mchunu says. Next, a means of communication to the local electoral delivery mechanisms was needed. In less than six weeks, the team trained staff and implemented a satellise-based wide-area network communications infrastructure. Some of these areas had never had munications services before

In addition to connecting local election officers to the IEC, the communications infrastructure also served as a basis for the registration process. Mchunu says they were able to register 9.7 million people in the first weekend slone

When it was time to vote, this communicat system enabled the team to disseminate results in real time on large-scale GIS maps so the media and political parties could map the progress. The elecons took 14 hours, with 16.2 million people voting. The most gratifying moment "was the evening

when the final results were announced," says Mchunu, reflecting on the IEC's success with the election. "Leading-edge technology provided our organization with the ability to invigorate pride in our ntry and our people."

Digital Nervous System Speeds Airline Data to Customers, Employees

MAGINE IF BUYING an airplane ticket were as easy as taking money from an automated teller

Well, it can be - at least if you fly Delta. As part of its new customer care syste Atlanta-based Delta Air Lines Inc. has installed new self-service ticketing kiosks at Delta Shuttle loca-tions in Boston, Washington and New York and plans to roll out kiosks in additional cities this

But that's not all: The new system, designed by Delta Technology Inc., the airline's information technology subsidiary, also includes such features as an electronic gate reader that processes passenger boarding cards automatically using bur-code technology and new gate and boarding software that provides flight summaries and passenger information

such as updated seating charts. The kiosks allow passengers with electronic tickets to print out boarding cards with just a few taps on a screen. Customer information displays show real-time updates, including the status of inbound and outbound flights, the expected length of any delays, the type of meal on your flight and the weather conditions at your destination.

In addition, passengers can access inform such as their itineraries, flight schedules and realtime arrival and departure information. They can also access same-day gate information via the Inter net using wireless communication devices including pagers, cellular phones, personal digital assistants and handheld PCs.

The customer care system is part of the "dis nervous system," an integrated digital network that collects data, records events - such as mechanical problems with a plane or even bag check-in times and automatically gets accurate, up-to-the-minute in-

and automaticany gets accurate, up to a man-formation for passengers and employees. Keith Halbert, senior vice president and chief de-velopment officer at Delta Technology, says the idea for the customer care system srew out of the airline's



COMPLETE SWOOT D

ess management software packages to give users.

Manufacturing

 Use of computer-eided design software over the inte net allows more than 30 nevel architects, fluid dyname and structural analysts to combine their talents in the de-sign of the yacht the America-One team entered in the America's Cup race (see story, page 41).

 Through a Davriose Drives system, fulfillment of factory orders inggers the pretting of manuals and documentation in the correct local language, with the finished

manual set available in a half-hour. Jumiper Networks Inc. offers the fastest resisting applications ever to traverse a wide-area network, with 26 bit/sec of aggregate throughput, setting the stage for the next-generation internet2 and enabling the flow of nch multimedia among people workdwide. The process of building a custom houseboat is one

gzed by providing Surnerset Custom Housesets' customers with access to their own Web pay where the factory posts photos of their books every day steing curtomers thousands of dollars ■ The strong integration of electronics in cars by Vote en AG promotes improvements in functionality.

omfort, safety and value for drivers.

Aedia. Arts & Entertainment An immursive interactive connection to engoing sport

ing events over the internet from Queldus Sports Inc. tistes a montage of experiences for wewers. The planeering development of streaming media tech nology from PlantMetworks Inc., is helping transform the internet into the next mass medium by making realtime Internet broadcasting possible and prolitable.

Through Riverbed's Sped project, integration of pro jected images of dancers, with live choreography, gives rise to a new artistic expenence and provides a new

perfect digital record of dance performances. Closed captoring and video descriptions from the WOSH Educational Foundation make TV, film and digital media more acceptate to 37 milion Ameri cars with sensory disabilities.

A new form of arts center. Zourn, merges the per-forming, visual and media arts with the tools, images and content of contemporary culture

ledicine

Through the American Red Cross* Displaced Persons Linking System, mobile computing, digital imaging and the internet help re-establish cor-

the victims of disasters. Inc.'s Global Health Portal, provides health care tion for the public, individuals with health conthose who have recovered from many or dis

invest the among:

Through the NDC Health Information Servic

Care Reminder, patients receive personalized and cor dential reminders we pager, voice mail, e-mail or fax to take their medicine or refit prescriptions, ensuring that

emany care physicians; and provides second to patients in 30 countries.





2 pm conference call

Go shead and multitasic. As an independent professional, you're an expert in your field, and the master of your day-you're a guru. Whether you're a virtual CIO, sales consultant, or anything in between, you now have a home on the web. A gold mine of projects, resources like health insurance and tax tips, and a place to



SPECIAL REPORT SMITHSONIAN

plans to enhance customers' airport experiences and to create new IT capabilities within Delta.

"Delta Technology laid the foundation for the digital nervous system," says Halbert. And that foundation "formed our ability to deliver our new customer

Halbert says that in a way, the company built a set of sophisticated tools — an entire system — to holistically care for its customers. The idea, he says, was to make it easier for Delta's employees to provide customers with the best possible service. "We [focused on] how to make time fly for customers with the set of the same service."

provide customers with the best possible service.

"We Ifocused onl how to make time fly for customers," be says. "Now, passengers can check in at the curb and get their boarding pass, even if they're not checking in any bags. Or they can go to the self-serve kiosik and get an electronic ticket and proceed

to the gate.

"And the customer information displays tell you how long your trip will take, what food is on the plane, what the configuration of the seats is, and will eventually show you a clip of the [onboard] movie." Halbert says. "These are all things cus-

tomers have been asking us for."
Krista Pappas, an analyst at Gomez Advisors Inc.
in Lincoln, Mass., says the customer care system
shows that Delta has none to great lengths to hold

consumers' hands.

"Customer confidence is very important." Pappas says. "It's important to add different avenues by which customer can access different information. Delta is increasing its value to its customers, especially to the road warriors or business travelers, as well as to all the people on the road, by allowing them to access information through their handleds."

CANADIAN PAYMENTS ASSOCIATION

Money Transfer Technology Brings Canada Up to Speed

TROUBLEM WITH MOVING money around in Canada six years ago was that it took a while to determine whether a

check was good.

The fastest method, the Interbank
International Psyments System, took an entire day.
During that day, anything could happen — the person who sent the money could withdraw all his funds

or go bankrupt, or the bank itself could go under. As a result, blose on the receiving end had to either trust the sender and his bank or wait before doing anything with the money. In a worst-case scenaria, a bad money transfer for a large amount could cause a domino effect across the banking system, as company after company and bank after bank drew on monexistent funds to make payments, transfers and

withdrawals.

To solve that problem, the Canadian Payments
Association (CPA) in Ottawa and its member banks
decided to create a system for guaranteeing money
transfers. Called the Large Value Transfer System

transfers. Called the Large Value Transfer System (LVTS), the system was launched in February 1999. The guarantee works in two ways, according to CPA general manager Bob Hammond. First, participating banks put some money on deposit at the Bank of Canada. Which acts as a central clear/archeaus.



There must be enough money to ensure that all transfers out of the bank's accounts — minus the amount of transfers to the bank— are guaranteed. Second, each member bank pledges a certain amou

Secona, eaco memor paint peoges a certain amount of money into a kind of insurance account or shortterm loan system.

Accounts are still settled at the end of the day.

Accounts are still settled at the end of the day.

plans for real-time settlement.
At first, Hammond says, he expected that the LVTS
— which is more expensive than writing an ordinary
check — would be used for transfers of \$50,000 or
more. "But we're finding that 50% of payments are

for less than \$50,000; he says.

Today, reflecting the value the LVTS provides banks and businesses, come \$100 billion goes through the system each day, Hammond says. compared with a mere \$20 billion through the old non-secured network, the Automated Clearing Settlement System.

Only 15 of the largest banks in Canada belong to the LVTS, Hammond says, but they in turn offer access to the system to smaller banks. Bank of America Corp. in Charlotte, N.C., was one of the first to join and uses LVTS to offer its own branches worldwide, as well as other banks, access to Canada's financial system.

"It is an extremely efficient, fast and sound way for us to offer our clients finality of payments," says Susan Roberts, vice president of Bank of America's Canadian branch operations. She says the system was one of the top five worldwide, and it was installed at inger the aither time.

"It allowed us the time to get ready internally for it to come," Roberts says. Members have to invest in back-office computer equipment and dedicated terminals. Hammond potes.

The limited access and dedicated lines help make the entire system more secure, he added. We have the latest security arrangements, he says. When LVTS was lunched last year, it brought Canada in line with other industrialized nations, many of which, including the U.S., have systems that provise certainty of settlement and finality of pay-

"This is extremely important in making the impotant and time-sensitive payments that are involves in major business transactious and international trade," he says. 8

ment. Hammond says.

Swithsonian Awards2000 Finalists

Continued from page 43
Nestional Marrow Donor Program's Searth Tracking and Registry system improves the outcomes of this complex procedure.

Science

= 30 design tools from Hawkes Ocean Technologies" Deep Flight Project enabled the creation of a small inexpense submessible cost that can take scientists deep into the coran, making the exploration of this visit

resource economical for the first time.

Biffleam line. a re-recognition technology allows for secure biometric identification through recognition of the unique patterns in the site of the human eye, eleminating the need for passwords and other forms of identification that are smalled components.

a Through the Matienal Cancer Institute/

Advanced Blomedical Computing Center's Compute Similations of Proteins and Engines Involved in Cancer and MISS project, companies insulation of the behavior of an enzyme implicated in cencer opens the door to the design of a drug that would block its activity and provides a model for failure will discovery. In Advanced algorithms and high-performance super-

» Advanced algorithms and high-performance supercomputers from the Heaval Research Laboratory's Eddy-Resolving Blobal Ocean Modelling and Prediction project enable the prediction of ocean behavior and set the stage for Mana Sovecasts that will be occurate weeks months and, perform, years in advance.
• Mana then I million home commotes process astrowaldes then I million home commotes process astro-

Mains then 1 million have computers process setronomical data in their spare time through the Universal of Califfornia at Berhaley Spaces Science Laterateury's SCTIFFhome Project, achieving an aggraga processing speed 56 times that of the largest bridfion's supercomputer and representing the world's largest us of identification computing.

Transportation

• An integrated digital restancts of Dastas Ale Lineae has collects drift, records events and aetermatically pushes accounts, up to the relaxed information to employees and presentages, spling fleet the information they need believe they said for it does story, page 433.
• If the world's bussels call system, that of the Melineitro of Flashman, The Penople's Republic of Chilar provides coordination and distribution of flicies from control distributions system.

A million persongers per day.

4 million persongers per day.

10 million persongers per day.

10 million persongers per day.

10 million containers transcripment hab noutes more than 10 million containers each year from one ship to another.

by completely automating the process and loading and unloading their at mist of three containers per minute # Electronic within blother from Netherd Afe Lineae lease. In Information services division provide the speed and fiscilially oil restant tucketing and administer the worr of lost. (expotine or stolen tuckets. # The conditionation of a three-last client/server architects.

ture and object-based lactivology from VR Geroup Lad.'s licket sales system provides a single point of service that customers can use to access all rail services.

Unlocking the mysteries of eBusiness



Let's the CL 4Bourness of it a ryte - I most people. How do you get from there to there? And once you're there have do you greater? It is a minimised intension, one that party lasks the help of person software and exert. And that is the bourness of intends? We we get all those years of CR secretices on the Re politicing on in these searching the Relief of the CR in the Relief of the Relief o

GOMPUTER

interRiz



What would you do if marketing could update the Web site on its own?

"I'd stop hiding from marketing and customer service and sales a

CONTENT MANAGEMENT should be easy. Up and running without a hassle—or iff overload. That's what Eprise does. No client software. No database to design. Just a powerful content management application that lets business users create, update, and target Web-based content. After all, what good is a Web site if it card defice information immediately. If not scores: What would you do with your Web site if you could? Let us know. WWW.EPRISE.COM



BUSINESS

MOM-AND-POP Software

When Honda Trading America Corp. needed new software to manage its steel and aluminum supply chain, it turned to Blinco Systems, a 12-person, family-run software developer in Torotto. Like Blinco's other customers, Honda — which does 13.2 billion in business annually—asyste company's small size actually offers added benefits. 50

EXECUTIVE SHUFFLE

CIOs are making their way to the executive suite. As IT continues to play a larger role in business, more companies are tapping their IT directors to head up docom spin-offs, and corporate CIOs are taking CEO slots at new Internet marketplaces. It's a natural move, analysts asy, in a world in which technology changes every day, a 82

BIDDING WARS

The ongoing battle between elbay and Bidder's Edge could have a miscoeffect on the future of both businesses as well as ste hatterent in general, say analysts. They warn that whatever the outcome, the case will force a serious debate about legal boundaries and access to information on the Web. 54

ONSTAR GROWTH

GM recently announced an agreement with Honda to license its OnStar Global Positioning System for use in Acura luxury-model cars. GM is hoping that leasing its technology to competitors can help boost its revenue from \$61 million this year to \$2.3 billion in 2005. • 55

WORKING AT WINNIE

In Forest City, Iowa, population 4,500, Winnebago Industries is just about the only IT shop around, Joel Albertson, senior computer analyst at the motor-home manufacture, tells what it's like to work in the IT department, or what employees affection-ately refer to as the "doghouse," of this rural company, 369

BEST PLACES To work in It

The results are in. Computerworld's Seventh Annual Best Places to Work feature lists the top 100 companies at attracting and retaining IT talent. Find out what these leaders do to keep employees happy and on the job. 8 [©]

UCITA STORM

Since its inception four years ago, the Uniform Computer Information Transactions Act has prompted a storm of controversy. Many say the legislation gives wendors an unfair advantage. But proponents inisti it's simply aimed at creating consistent rules for software licensing and contracts. 8 72

MORE



THE CHALLENGES OF E-MARKETS

ONLINE BUSINESS TO-BUSINESS exchanges have been catching on in most major industries. Automakers, utilities, retail outlets and chemical companies are combining power and resources to bring down prices from suppliers and speed up delivery. But just as they've been gaining steam, these marketplaces have been raising several questions, ranging from planning to logistics to staffing to legal boundaries.

Mom-and-Pop Approach Works for Developer

Despite its small size, clients swear by family-owned supply-chain software firm

HO SAYS bigger is always Certainly not the cus-

to-based Blinco Systems Inc., a 12-person. family-owned and -operated developer of international sup-ply-chain and distribution software called 3rdWave and 3rd-Wave Logistics.

Take for example Honds Trading America Corp. in Marysville, Ohio. The international importer and exporter of steel, aluminum, plastic raw materials and automotive parts must balance its supply needs with the manufacturing, assembly and processing requirements of its many domes-

Wby would a firm like Honda Trading America, which is jointly owned by Honda Trading Corp. and American Honda Motor Co. in Torrance. Calif. and does more than \$1.2 billion. in business annually choose to work with a firm as small as

Blinco? Because Blinco is a small company, said Blair Puiii, Honda's senior assistant manager

of information technology "They can rapidly [adapt] the software as our business changes," said Fuili. "And they can do it rather quickly, sometimes within three months. It's that flexibility that sets them

megrown Software Edward "Ned" Blinick, who

runs Blinco Systems with his brother, David, said the company grew out of the family's international food importing and distribution business, which he and David started in

peration, the brothers decided to develop a system to manage its supply-chain logistics. Then in 1994, realizing that the software business they began two years earlier was more profitable than the food business, they decided to devote themselves and their five employees full time to the software business.

In 1993, Fuiti said, when Honda Trading America decided it needed to become a complete supply-chain presnization in order to be a more effective business, it began looking around for a company that could develop just the



your because they were so small, but they proved they could deli-

Today, Blinco Systems employs just 12 people: David, who is president and CEO: Ned, who is vice president eight programmers; and two mentation specialists Ned Blinick said the com pany, which currently has 15 active clients, is looking to add

two or three more program mers and a salesperson within the next several months Staying small allows Blinco Systems to develop totally "client-centric" products, be said, explaining that the company can easily adapt its software to fit its customers' needs without having to reinvent the

wheel But if Blinco lands more customers, the Blinicks understand the company will have to grow. The question is how

right software to allow the firm to manage its entire steel and aluminum supply chain. We looked at large companies like Big Blue [IBM] and

smaller firms," Fujii said. "We needed a company that could move quickly and could speak our language." And Blinco Systems fit the bill. Fusii said. Even though the

company was small - four people in 1993 - it was willing to send someone to Ohio to learn about Honda Trading America's business, he said. "They came and spent time

talking to people, especially those closest to the project, the people who key in the data. And they were quick studies," Fujii said. "They listened to the process and understood what is important to our busi-

Blinco Systems' operations are tems is like working with a compatible with Honda Tradtrue partner, not a purveyor of ing America's needs.

services. Anthony Prossi, director of information systems at Rothco, a global importer and exporter of military-type apparel and accessories, agreed Blinco Systems knows how to deliver quality to its customers.

Change of Heart

"Originally when we set out to look for software, we were looking for a larger company with a more established customer base," Prossi said. "But we were also looking for a company that could fill certain needs, like being able to handle Rothco's rapid-ordering system."

Rothco, which does about \$55 million in business annually, also wanted an integrated system to handle its import and export sales needs. The problem, Prossi said was that Rothco couldn't find a

company that could integrate all its back- and front-office What Rothco needed was a

company to customize its software to Rothco's business, something large companies are senerally unwilling to do Prossi said

"Large cor more interested in you adapting to their software," Prossi said. "But Blinco Systems custom-tailored its software to

"We were a little nervous because they were so small, but they proved they could deliver what they promised," he added. "We've been running live with their full system for a year now, and it has exceeded our expectations."

John Fontanella, an analyst at Forrester Research Inc. in Cambridge, Mass., said 3rd-Wave can do far more than other supply-chain software systems available.

"There aren't many other (systems) that have the level of functionality that 3rdWave has," he said. "The company has an impressive list of users for its size and is well worth a look if you seek an integrated suite to manage domestic and international trade."

Not only does Blinco Systems understand the needs of large and medium-size businesses, but it can also handle the requirements of much smaller companies.

Philip Khazzam, president of family-owned Totally Nuts, a Montreal importer of nuts and dried fruits that does about \$10 million to \$12 million in business annually and has five employees, said Blinco Systems has a firsthand understandi of the challenges facing small

"When we heard they were going into the software business, we said that because they came from a small, familyowned food business, they would understand our needs Kharrom said B

FACILITATES end-to-es international and domestic supply-chain functions, including prepurchase

planning, order entry, sta of order, inventory control, tracking, shipment control product delivery, invoicing, customer service, foreign currency management, let-

and financial manage IS WRITTEN IN UP a leading, 4GL client/server development application; has a user-friendly graphi-cal user interface; supports EDI and automated fax; and is Internet- and intranet enabled.

ters of credit, acc

IB AN OPEN cavir supporting all major rela-tional databases, including Oracle, Informix and DR2; all major operating syste including Windows NT, Unix, Linux and 0S/400;

TCP/IP, DECast, Windows

ONE PLACE



IBM

18M busines storage servers

echnology Innovation Magic

More Techies Moving Up to Executive Suite

Corporate CIOs finding new jobs as dot-com CEOs

ARE BASS used to spend the hetter part of his working day developing software Now he can usually be found in the company of customers, industry analysis, reporters

Bass, CEO of Buzzsaw.com Inc., is among an increasing number of CIOs. information technology directors and software development professionals Issueching served carners in the executive suite. They're becoming CEOs at their companies' dot-com spin-offs or at new Internet marketelaces.

Bass said he's a natural choice for an online CEO slot "In this world of hosted applications and [durital] marketplaces, a huge part

of the deal is getting the IT infrastructure correct, which is something that has been the lifeblood of CIOs for years," Bass said. Exact numbers are hard to come by but individual examples of CIOsturned-CEOs abound. High-profile companies such as Chicago-based W.W. Grainger Inc., Atlanta-based Delta Air Lines Inc. and Detroit-based General Motors Corp. have all shifted

technology experts into either CEO

tronic-business strategy positions during the past 18 months.

New Internet marketolaces are following suit. A prime example is Boss' Buzzsaw.com in San Francisco, a business-to-business exchange that lets orchitects, suppliers and builders collabgrate on projects and trade goods and services online. The 8-month-old startup is a spin-off of San Rafael, Calif.based Autodesk Inc., a developer of

computer-aided design software and other applications Bass, Autodesk's former chief techpology officer said he understands the

need to invest heavily in IT. 'My question often to the IT team here is. 'Are we spending enough?' " he said. "We have hit upon a market opportunity where the failure of our IT systems is one of the things that could really cripple our ability to succeed.... Not to do the appropriate things in IT is inst inevensable

Abbas Sved spent 12 years developing e-commerce software at Hewlett-Packard Co. and Sun Microsystems Inc. before becoming CEO of Mountain View, Calif-based OneBuild Inc., a new Internet procurement marketplace for the commercial construction industry.

It's easy for people with a technology background to grasp the business part of things and combine the two." Syed said. *But for people who come purely from the business side, it's harder to leverage technology to better direct the business. The reasons are that the technology is so complex and it is changing every day."

That makes sense to business expert

Not to do the appropriate things in IT is just inexcusable.

CARL BASS, CFO.



Thorston May, vice president of research at Cambridge Technology Partners Inc. in Cambridge, Mass. "In this rapidly changing world where your business model changes

every six weeks, the people most comfortable working with those changes are those from the technology commo nity," May said.

Still, the transition hasn't been with out its challenges.

"There was a steep learning curve I had to go through," Syed said. "For example, I didn't understand how to do market segme-otation. But learning is a part of life.

Not every CIO-turoed-CEO will face the same steep learning curve, said Michael Boyd, an analyst at International Data Corp. in Framingham, Mass. "The people running off to run dotcoms may come from the CIO ranks. but they may also have bad sales and marketing and other business experience," he said.



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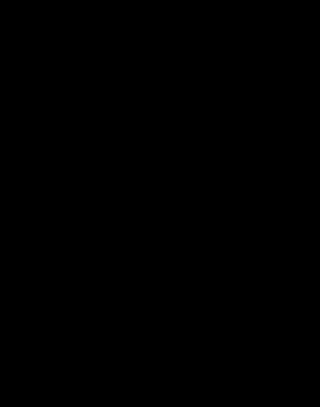


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More Techies Moving Up to Executive Suite

Corporate CIOs finding new jobs as dot-com CEOs

ARL BASS used to spend the better part of his working day developing software. Now, he can usually be found in the company of es, industry analysts, reporters

Bass, CEO of Buzzsaw.com Inc., is among an increasing number of CIOs, information technology directors and oftware development professionals launching second careers in the executive suite. They're becoming CEOs at their companies' dot-com spin-offs or at new Internet marketplaces.

Rass said be's a natural choice for an online CEO slot. In this world of hosted applications and (digital) marketplaces, a huge part of the deal is getting the IT infrastruc-

ture correct, which is something that has been the lifeblood of CIOs for years," Bass said. Exact numbers are hard to come by, but individual examples of CIOsturned-CEOs abound. High-profile panies such as Chicago-based

W.W. Grainger Inc., Atlanta-based Delta Air Lines Inc. and Detroit-based General Motors Corp. have all shifted technology experts into either CEO

tronic-business strategy positions during the past 18 months

New Interpet marketplaces are following suit. A prime example is Bass' Buzzsaw.com in San Francisco, a busi-ness-to-business exchange that lets architects, suppliers and builders collaborate on projects and trade goods and services online. The 8-month-old startup is a spin-off of San Rafael, Calif. based Autodesk Inc., a developer of

computer-sided design software and other applications. Bass, Autodesk's former chief technology officer, said he understands the

need to invest heavily in IT. "My question often to the IT team here is, 'Are we spending enough?" he said. "We have hit upon a market op-portunity where the failure of our IT systems is one of the things that could really cripple our ability to succeed. . . . Not to do the appropriate things in IT is

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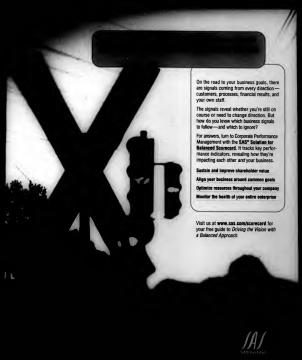


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U.S. Judge Blocks Web Bot From eBay Site

center of a fierce war, but this Court Judge Ronald Whyte one won't be won by the high-Online auction sites eBay Inc. est bidder. est bidder. based Bidder's Edge from us-and Bidder's Edge are at the On May 24, U.S. District ing an automated system to San Jose Federal District Court.

search eBay on the grounds that it could slow the auction giant's site. The injunction goes into effect June 8. By week's end, Bidder's Edge

The stakes are high for both companies, and the outcom could weigh heavily on their futures, said analysts. *EBay, as the gorilla in online

auctions, has captured a majority of the auction content on the Internet," said Vernoo Keenan, an Internet analyst at Keenan Vision Inc. in San Francisco. EBay is fighting aggregator sites to retain cont of its community of bidders

and cootent, he said. The decision could also have broader implications for the openness of the Internet, because it relies on laws against trespass, not copyright in-

Jonathan Moskin, an intellectual property lawyer at New York law firm Pennie & Edmonds, said the judge's ruling expanding the definition of trespassing oo physical prop-erty to include the Internet is controversial because it has

never been applied online. The war began back in December, wheo eBay filed suit sgainst Bidder's Edec, claiming that it violated eBay's copyrights and intellectual property. Bidder's Edge is one of many auction aggregator sites that search various online auctions with software robots, theo report the results to customers

In February, Bidder's Edge countered eBay's suit with its own antitrust lawsuit, alleging that eBay is trying to mocopo The U.S. Department of Jus-tice antitrust division is investigating the matter.

Whyte's 22-page ruling last month was very narrow. In his order, he denied eBay an injunction based on its allega tions that Bidder's Edge violat ed its copyright and trademark rights. Instead, he said, Bidder's Edge can't search eBay's database using a software ro bot because it could disrupt

"The law recognizes oo such right to use another's personal property," Whyte wrote.

But he didn't preclude Bid der's Edge from accessing information from eBay by other

Keenan backed Whyte's opinion, saying that ellay has a right to shield its content.

"I don't think that there is any public domain right to that information that eBay's col-lected," he said. "I think they have the right to protect their business."h

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BUSINESS

GM Now Sells Web Technology, Not Just Cars

In a bid to drum up a new income stream, General Motors Corp. recently licensed its On-Star communications technology to rival Honda Motor Co.

GM will also provide services such as emergency roadside assistance to Hooda cus-

Under the deal, Tokyo-based Honda will equip its 2002 Acura RL luxury sedans with the OnStar in-vehicle con tions system and services. Financial details weren't disclosed, but officials said other Honda vebicles could be added to the licensing agreement.

Using Global Positioning System (GPS) and cellular technology combined with an around-the-clock service center, OnStar provides emergency roadside assistance, stolen-vehicle tracking and concierge services. The GM subsidiary also plans to offer other e-commerce services this fall.

Detroit-based GM hones to groom OnStar into a major source of income. Chet Huber. OnStar's managing director. forecast OnStar's revenue to grow from \$61 million this year to \$2.3 billion in 2005. Last year, the world's largest automaker posted income of \$6 billion on revenue of \$177 billion. But more than one quarter of GM's profits came from GM Acceptance Corp., its financial services wing, a sign of bow important it is for GM to devel-OD NEW revenue sources.

"GM built an infrastructure that can be used like an ISP and they can repurpose it for other services," said lames McOulyey, an analyst at Forrester Research Inc. in Cambridge.

Annual subscription fees for OnStar start at \$199 for basic emergency services. It costs

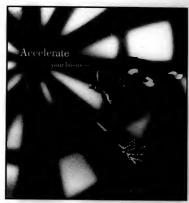
\$399 for additional travel and concierne services Ford Motor Co in Deschorn Mich., and DaimlerChrysler AG in Stuttgart, Germany, have

lar offerings. Ford offers in-vehicle navigation and emergency communication services in Lincolns Jaguars and Volvos and will offer services under the Lincoln Rescu service through Sprint PCS Group in Kansas City. Mo., this fall. But Ford hasn't decided on licensing to other

manufacturers, said spokes plans to license the Tele-Aid woman Fara Warner. Daimler roadside services and the Chrysler spokeswoman Ann Command navigation systems lar and Web services in vehi-Smith said the company has no available in Mercedes-Benz ve- cles fills a gap

hicles, but added, "We would | not rule [licensing] out." Thilo Koslowski, an analyst

Koslowski said offering On-Star in more-expensive Acura vehicles was a good strategy since consumers of lower-end vehicles, such as the Honda Civic, would be less likely to purchase the service.





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WORKSTYLES

What It's Like to Work at . . . Winnebago Industries Inc.

serior computer analyst, technology support stall Company; Winnestopa Industins line, a motor home manulacturer Main location: Forest City, lows, oposiation 4,500 Hemitter of Information technology simployees; 35 Marcher of employees; 35 Marcher of employees (end emm); 3,200 in forest City

Number of Information technology employees; 35 Muember of employees (end users); 3:200 in forest Diy plus 300 at three manufactuing plants across the state Turante: Filteen years. There aren't melly any other IT shops in fown."

In town."

We difficult is IT recruitleng? The locale is a problem. We recruit from does the Mermagnic and Cricago, Vox have the incruit Mr. There are prople who want to live in a smaller or to learn at Mr. There are prople who want to live in a smaller in to other - Individual hard in to other - Individual hard in the other - Individual hard SAO,000 to \$500,000. **

Center of Invited Trainistense: The majority of the IT satil cloud Company of the IT satil cloud Company of the IT satil cloud Depoting the programmers manifesting and emonology a manifestime and for home grown manifestime and home grown manifestime and

maintainer-based, homegrown manufacturing spalare for motor home production. The remainder of the staff is in operations and PC technical support, supporting 800 PC users ranging hom robotics and computeraided dissign and manufacturing users to field sales reps. What's your role? "I ware many latts - left-support, net

What's year role? "I wear many letts - letch support, net work administration, Web sith!" Dress code: Business cansal, with cansal Fridays Weerladay: "On boy, We are a 24/5 shop, and we have three shelts in IT. The only day we're

and orange, and we have written and within in IT. The only day we're not staffed in Sunday, My office or a manky on hom? 300 and to 4 p.m., but we standy on hom? 300 and to 4 p.m., but we standy stay hongs because of demand of ure are support or project deadlines. Do you need a security hadigue or caref to get lette the buildings or effect? "We have three or gets sets the complex with season's yielding you drive in and one security day, out the in and one security day of the end of the security hading the security of the

complex with security when you with me and one sountly dop, We have a threemotus amount or envertery here - both institud products and components - so don't leave without authority to the both with don't leave without authority of her leave the pro don't leave without authority of here in the early - Leake Coll - Leake Coll

70s. Winnebago had 12 sociahy dogs, and this is where they were housed this we appared and emodeled fer 17, but 15: Silf-referred to a stem? And the What do you see in people is weetbagoose? "A hit of pol his and member puring green, simulature motor homes at earthy pooling and at earthy pooling at the pooling and at earthy pooling at the pooling at the pool are done on the left." The sale is a submery at the attention of the pooling at the pooling at the attention of the pooling at the pool of the attention of the pooling at the pooling at the attention of the pooling at the pooling at the attention of the pooling at the pooling at the attention of the pooling at the pooling at the attention of the pooling at the pooling at the attention of the pooling at the pooling at the attention of the pooling at the pooling at the attention of the pooling at the pooling at the attention of the pooling at the pooling at the attention of the pooling at the pooling at the attention of the pooling at the pooling at the attention of the pooling attention of the pooling attention of the attention of the pooling attention of the pooling attention of the attention of the pooling attention of the pooling attention of the attention of the pooling attention of the pooling attention of the attention of the pooling attention of the pooling attention of the attention of the pooling attention of the pooling attention of the attention of the pooling attention of the pooling attention of the attention of the pooling attention of the pooling attention of the attention of the pooling attention of the pooling attention of the attention of the pooling

the big tools shows and all the Microsoft surrows. Employee reviews: Employee reviews: Armady Microsoft surrows and the "There are more people wanting to intered current grade." There are more people wanting to review from the baseness areast into if then the other ways around. Once pooled sere in If have, they want to stay in If! Must people surry beoppers? Cell phenes? Yes. "In operations and lesh support, we're baseably on call all the time. Hemshor of If amployees who telecomments: None Own-site day quart? No

Did you ever imagine that the phrase 7he Winnie would be part of the vernactilar among 18- to 24-yearolds? "We did the MTV Road Rules thing to get the came recognition - to get the personout there that motor homes are cool for all ages. And it's worked

well."

Perks: "We have an employee fleet of Winnebagos, and in the sammer you can put your name in for drawings to use a motor home on the weekends."

Employees can buy motor home or the person of the person of

The company do orenture - extremely a service of the company of th

PAUL A. STRASSMANN

GM's info gamble

HE NEWS THAT General Motors, one of the nation's richest corporations, is turning itself into 'the world's largest e-commerc company' (News, April I7) could affect the ambitions and plans of every corporate IT department.

The nation's top automaker announced that it would move into the worlds of online mortgages, cellular services and information delivery. GM also announced that it would sell its vehicle-based

Gentreety. Grad and an automaters.

As is the case with every computer-oriented publicity campaign, the rhector and new profit-promising visions permeate everything that GM has so far generated about its plans to also become a "new economy" company instead of continuing to be identified.

fled only as an "old ecocomy" maker of vebicles. The idea is to "grow profils, expand relationships, drive up revenues and the stock market price" with veorures such as selling customers Global Positioning System and cellular technology services. It sounds good and enticing, but I'd like to better understand bow well GM is

better understand how well GM is doing in the automobile business it has known for 70 years before it shifts into the volatile world of the information marketplace.

My first take on this was from the sharebolder erist standpoint; then well has GM managed its shareholder equiry? It's discouraging, During a receet period of unpercedented prosperity and growth in the values of giant U.S. firms, the company's shareholder equity has declined from \$2.3 billion in 1995 is \$15.1 billion in 1986, recovering to only \$2.00 billion list year. That's which we have the profit to be both the company's the back of the end of the profit to be both there.

bolder value. With last year's revenue of \$177 billion, it would take an enormous increase in revenue and profit for GM's information services business to make up the difference between its current financial results and the spectacular profit growth that some of the leading information services firms have shown. For such expecta-

Couts of efformation 234.8 254.8 255.9 256.0 Cout of opposite 5250.2 2550.2 2544.5 2550.5 Ratio of information consistent of pools 11.8% 11.8% 13.8% 13.8% 14.8%

tions to be realistic, look at other indicators of GM's demonstrated superiority. How well does GM manage its information

expenditures? One way to tell (see chart) is to examine how much information overhead — research and development, sales and general and administrative expenses — is needed to coordinate operations that produce and deliver tangible products or the cost of soods sold. The returns are discounts are discounts are discounts.

goods sold. The results are discouraging. As the table shows, the ratio of information costs to the cost of goods sold has crept up from 11.5% to 14.5% during the past three years. The steady rise in information

costs, which can be traced back to 1990, raises doubts about GM's claims that it has made gains from imaginative uses of IT, from e-commerce and improved computer

utilization.

To comprehend the significance of the 3.4% rise in the overhead ratio, realize that GM's ratio of net profits to costs it only 3%. Consist of the profits to costs it only 3%. Consist of the profits of the cost of the cos

competitors.

CIOs are feeling an urge to extend their influence from just tending internal information operations to becoming agents of so-called strategic repositioning of their firms. There's no clear connection between adding information value to existing operations and further diversifying a company into the information.

business.

My advice to ambitious CIOs: Doo't divert significant energies and resources into risky marketing ventures unless the fundamentals of the existing operations are already well under control. 9

Strassmann (paul@strassmann.com) once almost succumbed to the temptation of using a former employer's IT shop as the base for a commercial venture

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IT organizations can help an electronic marketplace succeed, but they can also stand in the way of progress. IT staffs not only must make the exchange work. but they also have to solve problems like getting potential suppliers on board and helping to straighten out thorny legal and ownership issues.

By Kim S. Nash

LECTRONIC MARKETS or business to business to business cachanges for stilling cocks and services online, have been exploding in mouther during the past manched to support players in the automotive, chemicals, retail and other indicates, with a consideration, with a mouth of the property of the property

But despite the promises e-markets offer they face major obstacles before they can be branded successful. Among the obstacles are having information technology staffs stuck in megaproject mode for e-market rollouts more akin to giant enterprise resource planning (ERP) system efforts, inducing suppliers to use the exchanges and working through big technology integration issues with all

members of the rexchange.
Then there are potentially hig legal potholes — namely, antitrust violations—that experts any may be inherent in doing this nort of business conflow. The feetherd Trate Commission of Tr. O has research to the commission of Tr. O has research to the commission of the conflow the whether owners of major e-markets may be able to shut out smaller compension of the electronic open-field process may lead to libragi on the commission of th

tions than transactions right now.
"We're definitely at the stage in this
whole thing that people keep inventing
as they move along. And some are better inventors than others," says Verson
Keenan, president of Keenan Vision
Inc., a San Francisco-based researcher.

Obsolete approaches to IT are also stalling many e-markets, says Kevn Costello, managing partner of the digital markets practice at Arthur Andersen LLP in Atlanta. "Landing three busloads of consultants in a building and setting them up for two years is not a winning proposition," be says. "This int' ERP." IT managers, he says, should instead plan short, intense project bursts of just a few months, tops.
That's the way it worked at Puel-Quest fac. a Houston-based petroleum exchange. The company chose software—mainly from Oracle Corp.—and didn't look back, says Rich Cilletto, president and GEO of PuelQuest.

which is due to go live Aug. L FuelOuest is aimed at marketers of gas and other fuels - companies that, for example, deliver to gas stations and such his commercial users as Dow Chemical Co. At FuelQuest, petro marketers will be able to order fuel. arrange delivery and take care of electronic invoicing and other logistics. Fifteen companies have signed up so far. Before joining FuelQuest in Stamford, Conn., Cilento founded a com pany called The Bollard Group, which installed technology for investment bankers. He also did an IT manageme stint at Xerox Corp, and helped rebuild

the mission control system at NASA. That kind of heavy-duty technology background is something many e-market CEOs don't have but need, says Chris Silv., an analyst at International Data Corp. in Framingham, Mass.

"A lot of the marketplaces out there now are leaning on the content side,

but that won't get them far," Silva says. For example, Manufacturing Central, et. which is overseen by the National Association of Manufacturers, a trade group in Washington, doesn't conduct transactions yet; it's in the middle of installing the technology infrastructure to do so. Active buying and selling is expected late this year. In the mean-time, it provides industry news and

community chat space.

Another problem for owners and operators of e-arabets is muscling suppliers onto the exchange. Small and missiste suppliers, in particular, often don't have the IT infrastructure needed to participate in e-markets; some have almost no computer systems at all. Costello advises e-market owners, to pay for any new gear that suppliers need. Owners should also pay for consultants — or lead their own IT people suitants — or lead their own IT people

Top B-to-B Exchanges

Though hundreds of e-markets exist and hundreds more are expected to materialize — just 50 to 100 will survive

e end of next year, AMR Resear icts. Here's a look at the top fiv		
ĸ	EXCHANGE	INSMESS
	Altra Energy	Selfs to utility

Ventro Corp. Builds vertical ventro corp market exchange on the Web.

SciQuest.com Scientific products science news to medical and science compenies

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— to install it. This will help smooth policical feathers and cost suppliers to participate, be says. Plus, it will help made to participate, be says. Plus, it will help make the exchange socressful, or make the exchange owners must overcome other political insens. Most created the properties of the political properties of the political properties. The exchange owners must create the properties of the properties of the properties of the properties. The exchange ownership is dominated by boyers only, then this is merely a year 2000 update to the decades-old practice of squeezing their

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supply chain, 'he says.
For example, Covisian, the e-marketplace owned by the Big Three automakers, will bave a tough time convincing suppliers to use the site,
convincing suppliers to use the site,
sometimes to reveal their princing,
there's not much value in it for supplice, 'he says. Indeed, in a countermove,
six major sawo parts suppliers, include,
ing Delphi Auroneovie Systems (ing Delphi Auroneovie Systems (in the
ing Delphi Auroneo

Vital to any exchange will be the cooperation of companies that are oth-

Reality Check

erwise fierce rivals. For example, exchange owners will have to share proprietary pricing and other information that they have historically been refuctant to share with competitors.

Several experts suggest appoi alliance managers from both the busi ness side and IT. Both should be wellversed in antitrust law, because the FTC and the U.S. Department of Justice are scrutinizing e-markets. 'Anytime there is some kind of pur-

chasing joint venture among competitors, it has the potential to raise antitrust issues," says Susan DeSanti, director of policy planning at the FTC in Washington. In particular, the FTC will look for signs of illegal cooperation at exchanges created by companies that clearly dominate a given market, DeSanti says. "We will ask, 'Is this an

exercise of market power that will have an impact on competition?" Perhaps the most critical question for IT is whether the technology itself will exacerbate antitrust problems. Here's one scenario: Buyer A wants 2 tons of iron and posts a proposal at

an online exchange. A supplier bids on the business. The supplier's competitors see the bid and undercut it. The process continues, with the price for

the iron eventually settling at the lowest point the suppliers are willing to go. Buyer A buys. Buyer B, also in the market for iron, watches the action and now knows roughly how the bidding will go. So, too, do the suppliers.

Ultimately, the suppliers become cautious, not necessarily rushing to offer cut-to-the-bone pricing just to win business. They watch what everybody else does, taking advantage of this new electronic window into a process that

used to be done more discreetly with paper, phones and personal meetings. The suppliers can now interpret the bids and adjust theirs accordingly.

This sort of price signaling may seem like smart business, but it violates antitrust laws. And yet it may be a nat-

ural outgrowth of e-market technology. "The same potential is there in all of these exchanges, where it's not explic-it, but implicit, that you're cooperating." says Mark Plotkin, an antitrust lawyer at Covington & Burling in Washington. Another potential problem is ex-changes like Covisint that are formed

by an industry's top players. By coming topether in such ventures, these firms may seem to present an overaggressive, "do this or else" posture to their suppliers and stifle competition from less powerful rivals.

That's part of what the FTC wants to uncover. The agency is already investi ting Covisint, which is due to launch se this year. "Because of the technological differences with these kinds of marketplaces, as opposed to physical marketplaces, they may raise some new [antitrust] questions we haven't thought of before," DeSanti says.

Ford Motor Co. CIO James Yost says. he's trying to guard against breaking antitrust laws. For example, Covisint plans to ensure that no member owns a bigger share of the new company than any other member, he says. "The key," Yost says, "is creating [the marketplace] as its own entity. It can't be tied back to any of the owners."

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ROM GREFFIN, CIO at The Home Depot: "We try to involve our (employees) in all aspects of the biz, and not just treat them as

100 Rest places

From training to technology to career planning, the top IT employers invest heavily in staff. Though that makes their employees more marketable, the risk is worth it to gain more loyal and satisfied employees. **Page 64**





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IBM

BUSINESS SPECIAL REPORT



THE NEW SUCCESSFUL WORKFORCE

The best IT employers know that the key to finding and keeping talented workers is to listen to their ideas, invest in their careers and be flexible with their jobs. By Lee Copeland

F YOU'RE GOING TO style your business for the Internet, you're going to need IT talent. And right now, demand outstrips the supply of good technologists by far, making it tougher than ever to re-

tain staff.

That means information technology managers must focus on cultivating top performers and motivating them into staying onboard rather than chasing af-

performers and motivating them into staying onboard rather than chasing after bigger paychecks elsewhere. While there are numerous tactics that companies can deploy to keep their best and brightest — from extending inflated counteroffers to chalaing them to their workstations — the most effective strategy is keeping employees from wanting to jump ship in the first place. By all accounts, compensation remains the key to opening the door to a

by an account, compensation remains the key to opening the door to a job candidate's commitment. IT professionals know what they're worth and aren't afraid to demand competitive pay.

But keeping the people you recruit from poing back out that door involves much more than cold, hard cash, at the companies that qualify as Companier world's Best Places to Work in TI. consenses building management styles, commitment to professional training and flexible working arrangements belp keep IT staff content and turnover low.

Squeaky Wheels Bet the Brease Bill Meadors wants to Jearn Spa

Bill Meadors wants to learn Spanish. In the next few weeks, Meadors, lead systems analyst at TECO Energy Inc., a public gas and electricity utility in Tampa, Fla., will start a beginning Spanish course at a local community

college.

Currently, Meadors doesn't need to speak Spanish at TECO. But he says he's looking ahead to possibly workin

he's looking ahead to possibly working with TECO's Guatemakan subsidiary, or moving into a business development role that would involve working with Hispanic commercial accounts. "We don't have to have just technolo-

gy training," says Meadors. "As long as the company can see the benefit for the benefit of the benefit so the benefit so the benefit so the benefit so the benines, it's OK. Who's to say two to three years from now two the in IT. but in some other part of the business? Joseph Wiley, TECO Energy's CLO, says offering training that takes into account the company's needs inside IT — and the employer's long-term plans outside IT — involves risk: The training the plane is the property of the plane of the property of the plane of the plane

But Wiley says he believes these types of expanded training opportunities create more motivated employees. He says it helps build company loyalty, even if the employee moves to another department later in his career. "If someone comes to work in an IT

function, then decides they want to be in marketing or in the power plant, there is a semiannual process review and those goals get factored into their work objective," explains Wiley. "We try to focus on work and personal ob-

Mendors, a IP-year TECO vesteran, says that allowing workers to pursue a combination of training courses makes a compelling case for staying put. Like many career-minded IT profes-

sionals, Meadors says he wants to strengthen 'hard' technology skills, like programming technology skills, like also wants to develop soft skills, like management techniques or knowledge of business functions.

New Workforce, page 66

BEST PLACES TO WORK IN IT

In This Series

THIS ISSUE:

Workfore: The New Successful Workfore; The New Successful Workfore; Thy Iris Coppiant, The best IT campion; Income that the lay to finding and keeping intended workers in to let this to learn to their locate, sweet the its bettern to their locate, sweet the its best on their locate, invest the its owner, and be flexible with their process and be flexible in the converse and be flexible; The IRO Best Places to Work in IT.º Full reading and information on the offeringing of the to.

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AUNE 12 ISSUE

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Treatment or reasons for Staff Marlettable." By Erk Sherman. More than anything, IT professionals value training. The Best Places to Wark are wiling to take the risk of keeping their staff current on hot stolle. Plus: The ID Best Places for Tainines.

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BUSINESSSPECIAL REPORT

THE NEW

Continued from page 64
"It's more than money that makes a place a good place to work," Meadors says. "ITECOI wants someone with broader business experience, not just someone who can write good Cobol or C++ code. A lot of projects require good code writing, but they also require good cost justification, a well-

written proposal and some understanding of the business process." In the past year, and on the compa-ny's dime, Meadors finished a course in the Internet programming language HTML. He also takes your classes during his lunch hour to reduce stress, he says. In September, he plans to take a programming course on sales and aution prior to starting a project alone those lines for TECO.

Angie Brown, a systems engineer for the past two years at home improve-ment retailer The Home Depot Inc. in Atlanta, says that in addition to train ing, assignment choice plays a key role in her job satisfaction. Brown says managers "influence but do not control people" and seek input from employees while developing IT projects

"We have a lot of bright people, and if they can be engaged in our issues and challenges, we can come up with better solutions," says Ron Griffin, CIO at The Home Depot, "We try to involve our (employees) in all aspects of the biz, and not just treat them as techno-

Griffin says that by involving the sembers of his staff in the decision process, they get more involved in ng the best solution. The srowing retail chain, which has more than 950 stores, boasts a dramatically low 3.5% over rate. Griffin says that's due to the \$9,000 spent annually oo training per employee, and on the consensusbuilding style that he cultivates from

the top down in IT. Technology managers at Allstate Corp. in Northbrook, Ill., also give IT sployees a say in determining which projects they will take on next

Through an internal "All-of-us-at Allstate" intranet site, staff members can apply for new assignments as they become available. Each posting includes the duration, scope and skills required for the project. A man-ager then determines if that employee

has the right skills for the project. "We encourage our employees to take ownership of their own careers and take a proactive role in determining what they want to do," says Mike Escabar assistant vice president of enterprise and shared services systems and a 25-year Allstate veteran. People looking for stability mucht go to corporate systems, financial and the HR systems area . . . but others

can move on every few months to something else In addition to letting employees choose work assignments, it's important to offer a full range of assignments as well. Escobar says the company's status as a traditional \$27 billion brick and-mortar insurance company cum dot-com helps lure Internet-savvy new

talent and keep the incumbeots ooboard Last year, Allstate Isunched a wide ranging initiative to sell its policies through traditional agents, as well as via direct call centers and over the Web. Officials say the company's IT

We encourage our employees to take ownership of their

own careers and take a proactive role in determining what they want to do.

MIKE ESCOBAR, ASSISTANT VICE PRESIDENT ENTERPRISE AND SHARED SERVICES SYSTEMS, ALLSTATE CORP.

project mix - from back-end legacy system maintenance to e-commerce development - offers a smortasbord of opportunities to keep a diverse range of staff appetites satisted.

"There is an upper-level commitment to technology," says Escobar. Allstate.com is "our biggest-priority. No. I project with a No. I focus. It's an allure for people looking at what kind of projects they will do and who want to know that we're working oo the prwest technology."

Seeking Balance

Accommodating the needs of an employee's family life also creates more job satisfaction, say IT professionals And it requires flexibility from man-

After five years at United Stationers Inc., Debbie Buchholz was ready for a change, Buchholz worked as a comput er programmer and systems analyst at the Des Plaines, Ill-based wholesaler of office supplies and equipment. Yet she wanted to start a family and spend less time in the office

Like the heads of more and more I'l departments, United Stationers CIO Ergin Uskup worked out a compromise with Buchholz to keep her oo staff. work three days at home and two days in the office.

"We doo't have dozens of peor working from home in Illinois, but we're not a running a sweatshop either," Uskup says, "But we try to accommodate our staff, and we tend to tailor hours to the individual's needs Most people don't en home at 5 o'clock, but we try to keep a bala and figure out ways to make it work.

We realize people have lives." The Home Depot's Griffin echoes those sentimeots. "We say: Be there for the significant life experiences of your family. Balance your work schedule and deal with family issues as you need to," he says.

While Griffin doesn't allow his staff to telecommute, be staggers start times and tries to accommodate family events. For example, he might allow an employee to leave the office early to attend a child's play.

The Home Depot also works with Habitat for Humanity, which builds houses for low-income families. The Home Depot's IT shop has built a house for the nooprofit organi each of the past nine years. The construction used to take eight weeks to complete. To make it easier for IT vol unteers to participate. Griffin now schedules the annual house building during the workweek. "Many of them are already working 60 hours per week, and I'd hate for them to take

more time away from their families." he says. "I want people to have balanced lives, and it's a great opportunity to work out of the regular setting with their team and other teams." In Buchholz's case, flexible schedul ing involved more than just philanthropy. It kept her on staff at United

"Otherwise, I would oot have stayed," acknowledges Buchholz, no an MIS project manager at United Stationers and a mother of two. After managing a yearlong mainfra migratioo project, she received the promotion from programmer four VERES AND.

"I had to earn that," Buccholz says proudly. "I still had to prove that I could manage a project and a team and still work from home. It's been really nice to have this flextime, because I doo't think I could work five days in the office. My kids have not been in day care; they're with me, and that's



From the Editor

Of all the special projects we wont each year at Computerworld, the Places to Work in IT feature contito draw the widest interest. Calls con into our editorial offices all year long when our next survey will be

And no wonder. Recruiting and re nilon have become the most impo

tant - and time-consuming - issues that IT managers face. In this issue, and conti June 12, 19 and 25 issues of Ci

mpanies that excel at finding a sping IT talent. They are true "o yers of choice" - boasting low lower and high staff loyaby. As the stories of these com ing IT workers. They have found th

keys to be simple: In Treat workers with

own careers. • Make the office a fun place. As you will see from the co

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BUSINESSSPECIAL REPORT



Methodology Comput 100 Best

Computerworld's 7th Annual 100 Best Places to Work in IT Study

OR THE SEVENTH YEAR IN A ROW, Computerworld conducted its annual survey to identify the 100 best places to work for IT professionals. From Jan. 21 through March 8, Computerworld invited CIOs, vice presidents and IT directors at U.S.-based companies that had revenue of \$500 million or

more last year and a minimum IT staff of I employees to participate in the survey. Respondents submitted information about their IT organizations online at www. computerworld.com.

Computerworld's 46-question online survey asked about the organizations' benefits, training and development, average

Rank Lucinos Sister		IZ headquarters location	Withoutsey	
1 The Home Deput Inc.	Retail -	Atlenta	www.homedepot.com	3%
Calest Corp.	Specialty chamicals manufacturing	Booker	www.celet-corp.com ,	10%
3 Federal Express Corp.	Business services	Collierville, Tonn.	www.fedes.com	7%
Harris's Entertainment Inc.	Entotulament	Morphis	www.hartolu.com	8%
5 Texas instruments Inc.	Manufacturing	Dalles	www.Loop	3%
Walted Studenters Inc.	Retail	Dos Plaines, III.	www.unitodatationers.com	5%
7 Fifth Third Buscory	Sanking	Cincinnet	www.53.com	2%
Area Products Inc.	Retail	Rys, N.Y.	WWW.MMA.CORD	9%
9 PrinsesischenauCoopers	Professional services/consulting	New York	www.pwoglobal.com	18%
State Street Corp.	Berling	Quincy, Mose.	www.elelestrect.com	10%
11 The MONY Group Inc.	Insurance	New York	www.mony.com	8%
Charles Subreal Co.	Rivercial services	San Francisco	www.acheels.com	10%
13 The Reader's Digest Association Inc.	Publishing	Pleasanthille, N.Y.	www.readendgest.com	1996
State Form Inspersor	Insurance	Strombigton, III.	www.palefore.com	4%
15 TECO Energy Inc.	Energy/utilities	Temps, Pls.	www.leccenterpy.com	6%
Albeigie Department Co.	Insurance	Northbrook, II.	www.shinin.com	6%
17 GATX Red	Transportation	Chicago	www.gebesl.com	9%
Lookbood Hartin Corp.	Defense/serrespace	Philadelphia	www.kirco.com	17%
10 CON Computer Centers Inc.	Computer dealer/resolver	Verson Hills, III.	www.cdw.com	9%
PhotBooks Phonoisi Corp.	Financial services	Buston	www.feeteeldooloonerper.com	10%
Littee PRC	Information technology	MicLean, Va.	WWW.DIC.COM	10%
Mathematic Incorpose Con.	Insulance	Columbus, Ohio	www.neleonide.com	276
23 Capital One Pleasolal Corp.	Financial services	Falls Church, Va.	www.capitalons.com	4%
Markey Busideen Inc.	Automotive and transportation equipment	Mente	www.harler-dayldon.com	64
S Harleyoutto Group Inc.	Insurance	Harlespolls, Pa.	www.hurleronfleoraus.com	546
Minmets Life Insurance Co.	harace	St. Facil bline.	www.minnesshers.dual.com	9%
77 Staples Inc.	Retail	Framingham, Mass.	www.stocks.com	290
The Tendy Corp.	Read	Fort Worth, Toron	www.tendy.com	16%
19 Acres Bactronics inc.	Retail	Metalla NY	WWW.ATTON.COOT	8%
Andread Inc.	Computer services, softwere	San Rolant, Cult.	www.minduk.com	179
11 Royal Carlidona Cruloso Ltd.	Travel and entertainment	Mand	www.ccd.com	1796
Class Systems Inc.	Corrector restricturing	Sen inte	www.chco.com	7%
Computer Associates International Inc.	Computer services	Islanda, N.Y.	WWW.CA.COM	89
Land' (ind by.	Retail	Dedontle, We.	www.hodood.com	5%
o AFLAC Inc.	Insurance	Cohemban, Go.	www.efec.com	12%
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7 Corning Inc.	Telecommunications	Corning, N.Y.	www.coming.com	3%
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11 Home Shapping Retweek Inc.	Retail	St. Principura, Fla.	www.hoc.com	54
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13 Florida Power & Light Co.	Energy/utilizes	Amo Reach Fis	www.tolorous.com	194
Intel Corp.	Company minufacturing	Sente Class Calif	www.papeacom	996

salary increases, percentage of staff promoted, turnover rates and the percentage of women and minority employees in IT management positions. In addition, information was collected on each organization's hot projects, mentoring programs and a variety of benefits, ranging from elder care and child care to flexime and stock options. The final ranking was based on the results of the 46-question survey and wasn't limited to the data presented below. All quantitative data was scored separately and given equal weight in determining the final ranking. Rankings were based on the status of and information from the companies at that time. B

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BUSINESSSPECIAL REPORT

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45 International Truck and Engine Corp.	Automotive and transportation equipment	Culdrook Terrace, III.	www.nevister.com	3%
Million Graphics Inc.	Computer manufacturing	Mountain View, Celf.	www.aqi.com	17%
47 Sprint Corp.	Telecommunications	Overland Park, Kan.	www.sprint.com	7%
The Earthgrains Co.	Food industry	St. Louis	www.eartigrates.com	7%
40 Armet Inc.	Electronics and technology manufacturing	Chandler, Artz.	www.mnet.com	7%
MA UNICOR	Electronics and technology manufacturing	Washington	www.unicor.gov	196
SI Howlett-Packard Co.	Computer manufacturing	Palo Alto, Calif.	www.hp.com	15%
Household International Inc.	Financial services	Prospect Heights, III.	www.household.com	196
53 Merck & Co.	Pharmaceuticals	Whitehouse Station, N.J.	years/mercic.com	5%
SAS leadbate los.	Business services	Cary, N.C.	WWW.000.0000	3%
55 American Management Systems Inc.	Professional services/consulting	Fairfax, Va.	WWW.arrelinc.com	19%
Fredde Mar	Financial services	McLean, Va.	www.freddierrec.com	12%
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DPR Construction Inc.	Construction	Redwood City, Calif.	www.dorinc.com	10%
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to Deere & Co.	Equipment manufacturing	Moine, E.	WWW.downe.com	79
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55%	10%-20%	90%	(%-17%)	Less than 5%	2	\$3,800
10%	6%-10%	39%	Less than 5%	Less than 5%	10	
60%	299-2594	75%	279-25%	69-19h	7	\$2,000
59%	194-204	95%	166-556	Corp. From 19th	3	85.000
44%	276-25%	50%	Less than 5%	Less than 5%		_ \$L260
40%	279-27%	100%	16-5%		25	84,500
56%	896-20%	599	376-35%	69-10%	- :	\$4,500
59%	Less than 5%	655	476-45%	Lace than 5%	0	\$4,000
20%	176-576	879	279-25%	176-676	. 0	\$4,000
60%	199-2076	50%	19-5%	00-00h	5	\$2,000
499)	19-19h	40%	204-304	Lass Pen 57b	5	
429	FS-0%	30%	279-279	20%-30%		\$2,000
50%	79-5%	55%	25/6-30%	279-25%	5 10	\$1,200
25%	199-209	75%	391-40%	Less than 5%		\$2,008
52%	6%-10%	80%	W6-20%	(A)-174		\$2,500 \$3,500
34%	19-194	67%	379-479	50-0%	5	
40%	64-10h	10%	27%-25%	Constitution Selection	0	\$1,580
37%	199-20%	- 69	279-25%			\$2,000
700	7% 5%	20%	276-20% 10%-20%	Less Ben 5%		31,445
70%	94-0%	10%		Less than 596	15	\$7,000
30%	376-35%		2%-2%	274-25%	H	\$1,000
27%	374-35% 6%-0%	40%	. 10%-20%	6%-10%	10	36,000
49	10h-10h	70%	279-2579	Lass Stars STE	4	2,40
70%			49%-50%	Less than 5%		\$3,778
100	W-0%	70%	279-50%	171-074		\$1,00
	69-69-	50%	196-15%	0%-10%	10	\$1500

UCITA

E UNIFORM Computer Information ansactions Act

(UCITA) is a draft law that seeks to stent rules to software contracts and licensing

It was created and adopted by the National Conference of Commissioners on Uniform State Laws and was sent last July to the legislatures of all U.S. states and territories for ideration. But UCITA has been plagued by controversy almost since work began on

drafting it back in 1996. Opponents - and there are ny - say UCITA is too broad and gives far too much er to software vendors.

The simple case is that it is a bad thing for consumers of any type, whether you are an individual or a business," says Randy Roth, director of corporate purchasing at Principal Financial Group in Des Moines.

"The only organizations it is ed for are the software vendors," Roth adds. "Don't call it UCITA, just call it the Licensor Protection Act."

Skip Lockwood, director of Washington-based For a Com-petitive Information and Technology Economy (www.4citz. org), a coalition of end users and trade associations on posed to UCITA, agrees.

"UCITA is anticompetitive and is counter to the whole economic model we have been currently using," be says.

Thies of the Read

UCITA was born out of a need to have common, legally enforceable rules governing software contracts at a time when the Internet is rapidly changing the way people buy and use software, explains UCITA proponent Keith Kup-ferschmid, intellectual property counsel for the Software & Information Industry Association (SIIA) in Washington. "UCITA sets out the rules of

the road for licensing of software products, especially in the and open to varied interpreta-

DEFINITION

The Uniform Computer Information Transactions Act (UCITA) is a draft law aimed at creating consistent rules for software licensing and contracts.

What the States Are Doing With UCITA



filing date

se environment." be says. UCITA is very similar to the Uniform Commercial Code which covers physical products and goods. It establishes the legal rights of software buyers and sellers. It covers standard and custom-developed software licenses and those that deal with online access of software. It addresses issues such as shrink-wrapped and online click-through licenses, warranties, transfer of ownership rights, contract

terms, disputes and vendor liability for defects. Current laws are inadequate

tions in different states, says Kunferschmid

Also, currently there aren't uniform contract laws that ap-ply to custom-developed software, he says. Such issues are becoming more important as people use the Internet to cut across state lines when buying software, Kupferschmid adds. "The only uniform rules out

there apply to tangible goods - not the software on a CD-ROM, but on the CD-ROM itself." Kupferschmid savs.

One of the principal concerns among opponents of UCITA is that it automatically validates all the terms and con-

ditions in shrink-wrapped licenses, click-through agree-ments and default clauses without giving users mu course for legal redress, Lock-

wood says. "Under UCITA, those terms are just enforceable, period. It's the law," be says.

For instance, UCITA allows software companies to avoid liability for damage caused by defective software, even though the problems were undisclosed to the customer at the time of purchase.

Another major concern is a provision that says users who don't uphold software licens-

ing agreements could have their software shut down remotely by the manufact Other issues include provi sions prohibiting the transfer of software between companies. even in mergers and acquisitions, and other rules that tie

buyers to agreements that were disclosed only after purchase. The ability of each state to amend UCITA, and the fact that not all of them may eventually enact it, also weakens its potential of becoming a widely oted law, critics claim.

Supporters such as the SIIA dismiss such concerns and claim that customers remain free to negotiate their own terms with vendors. Important provisions - such as a 15-day notice period before a wender can disable software, for inetance - ensure consumer protection, say SIIA officials.

Cautiously Moving Ahead

But the controversy has caused states to exercise extreme caution as they move to

enact UCITA The Viceinia Senate was one of the first legislative bodies to approve the act, but enactment has been deferred to July 1, 2001, to accommodate provisions aimed at ensuring con-

sumer protection. Maryland also approved UCITA, and it appears to be poised to become the first state to enact it this October.

lowa, meanwhile, is trying to pass "bomb-shelter" legislation that would prevent consumers in the state from the effects of LICITA

Some states, including Ha waii and Illinois, have cons cred UCITA and have decided not to move forward with it. Although the legislation isn expected to be ratified by every state, it is expected to be introduced in all 50 states and territories during the next year

Lockwood says that more discussion about UCITA will only increase the ranks of his opposition group, 4cite.org. more members," be says. I

Dear Career Adviser:

I'm a college graduate and a 20-year information technology professional. I'm the CIO at a small company and interested in moving. I am responsible for numerous IT projects with budgets ranging to \$15 million. Is the Web. the right way to look for a new senior-level job?

Also, will my total years of experience, age or not being o "hands-on" techie with the latest programming skills work against me? -- CONCERNED CTO

Bear Concerned:

The intersection of CIO positions and job advertising on the Web has definitely arrived, affirms Tony Lee, editor in chief and general man-ager of The Wall Street Journal Interactive Edition, whose site (www.coreers.wei.com) includes plenty of CIO job listings, plus upper-level salary information and career resources. And you'll probably want to check out other sites such as CIO.com or even ership sites like Exec-U-Net and Netshare, where candidates pay to access un-

advertised positions, most of which have been posted by executive recruiters. Although many com don't expect CIOs to be hands on technical, Neil Fox, CIO and vice president of infor-

matioo systems at Management Recruiters International Inc. in Cleveland, says a good CIO should be at least moderately technically oriented. "Companies are seeking solid business experience plus technical expertise in

enterprise resource planning. help desk operations, IT processes and wide-area networking or want their CIO to lead an effort to benchmark best practices against similar-size companies," Fox says. Although a \$15 million buds might sound pretty large, he recommends stating your net budget of telecommunications bills or WAN expenses. competition or a smaller

fi fi Dear Career Adviser:

I've been a Sybase database administrator for two years and have more than five years of strong database modeling and design experience. I'm cerned that Subase doesn't offer the career opportunities that I'd have with Oracle. Am I wrong? I have taken classes

and computer-based training, but how do I get hands-on Oracle experience that i - UNDAUNTED DBA

Bear Undanated

Oracle definitely has a strong market position, and there are a lot of candidates out there with Oracle knowledge, says recruiter Matt Harris at TechLink Systems Inc. in San Francisco. On the other hand, while there are fewer opportunities with Sybase, there are also fewer qualified candidates. So take your pick; a bigger market. with more jobs and more

market with fewer openings but also fewer competitors. To add to your job security in the Sybase world - if you elect to stay with Sybase -Harris advises seeking out Sybase opportunities that are either extensive contracts or permanent jobs and to definitely start taking Oracle

classes. Thorough knowledge of two databases is a definite advantage, he says, and makes ate even more attractive to prospective employers.

Bear Career Adviser: After 15 years, my experi-

ence ranges from mainframe programming and Common mation Model manage ment to Internet and networking support. With a master's in library and inforwork in education. Implementing ac-

resources for 19 different campus es at o large university. I speak five languages, in cluding Japanese. and want to work for a technology company, prefer ably doing techni-

cal consulting in Asia. Given my skill set, will I be able to do this? -- WILLING TO TRAVEL

Dear Willing:

Your wish might come true, ace many foreign-capitalized American companies are hiring appressively in Asia right now, at a time when many Asians have come to the U.S. for work and exposure to advanced technolo gies, according to Michael Nishi, president of Asia-Net

(www.asla-net.com). Asia-Net is an online professional com-munity run by Scotts Valley Calif.-based Tapestry.Net Inc. that focuses on Far East career opportunities. The fact that you speak Japanese also should help but don't think is will be a slam dunk

industry specialization and broad-brush background may make Asian-based em ployers less likely to hire yo for technical Web consulting or

may find it hard at first to see you as skilled enough to make an imp diste contril tion or knowl edgeable enoug skills that would make you an ideal To see how you

can make yourself ore marketable internation ally - and at home - check your skill set against Nishi's ot-skills liet for Asian lobs The list includes a knowl edge of Web application pro gramming Isnguages such as Perl, HTML, Common Gateway Interface and Java; knowl edge of databases such as Oracle and SQL: experience with operating systems suc as Unix. Windows NT and

Linux; and some network and

Network Leaders Form Optical-Systems Firm

ntatives from Cloco Sysens Inc., Lucent Technologies c., Hertal Networks Corp. and Packard Co. have forme de Metworks Inc. to San Jose. rees carriers' costs of manag in the initial round of finan

Internet Service Firms Team Un

Swellah Internet services company with 63 employees. Prints said the acquisition will allow it to better serve a growing base of interna-tional clients.

Utilities to Develop European Exchange A group of 12 European utilit

SAS to Launch Online Spin-off

that it's creating a new a b oos internet operation ios LLC will be a wholi and soboldlary of Cary, N.C. and SAS. The company will

is to allow life scie

RM. Macromedia Bond for E-Biz Apps

iced a multiyear strai o that they hope will help th medizat o terrenore app ISM will license and distrik renoda's Likelilinda Perse

security experience, a ms for the Web. The ap nent also calls for IBM to be trial versions of Macromodia's Flash, Freehand, Director and Fireworks offerings with Web-

DoubleClick Rets On Flathase

of foot week that it he paired 80% of the stock of Fi

Shoot outs...

PC EXPO

Jacob Javits Convention Center, New York City

Exhibits: June 27-29, 2000 Conference: June 26-29, 2000

Use secree code M2AG when registering

Obesn't sound like the PC EXPO of last year, does it? Well, it's not. It's a new event that's as fast as the pace of today's economy. And if you sit still for too long, you'll be missing out on all the action.

Get started with a customized itinerary that moves you toward your solutions at lightning speed. Delve into the futura of handheld devices. Submit your RFPs, and be part of a live forum where leading vendors propose their solutions to real problems.

Listen and fearm as industry leaders shoot-it-out in head-th-head debbass. Set going on your SANS. BACK Windows Security Conflictations. Bell or your restoration growman Noverilla Brandhare On Tour. Check out or new separated conference program with special sessions for the Charmet, small business, and if exacutives. If all comings for ECPOT bits your and in the years to come. And for you're ready for an event that can offer strategies, solutions—and more than a few superprises—you'll be coming, too.

Act fast and register early. Go to www.pcexpo.com to get on board—and get the lowdown on all of the new developments you can expect to see, hear and do at PC EXPO this year.





TECHNOLOGY

TET'S ALL TALK

An evolving breed of Web applications that wrap around streaming video, audio and slides can provide one-tomany conferencing for up to 5,000 concurrent nsers a 76

FRAGMENTATION

Having 30,000 users accessing shared information on servers led to noticeable system performance degradation at Chevron Corp. The problem was disk frag mentation. Learn how Chevron cleaned up its problems. > 76

HANDS-ON MANAGEMENT

Tivoli Systems Inc. says companies that use its new Tivoli Device Manager can use the company's framework software to manage handhelds running the Palm operating system.) 76

CRUSOF LANDS

Gateway's announcement that it will use the Crusoe chip from Transmeta in Weh appliances marks the first use of the low-power processor by a major PC maker. Some IT managers are intrigued, but it's not clear when - or whether -- Crusoe will land in corporate systems + 80

BETTER FLATTER 18-in. LCD flat-panel

If you can handle the hefty purchase price, an onitor might he the

nicest thing IT could ever supply you with. according to reviews editor Russell Kay. It's easier on eyes, and it opens up new possibilities for multiple windows and multitasking. . 82

OHICKSTUDY As the demand for -

and hype surrounding handheld wireless Internet access grows, there's disagreement about the best way to put Weh pages on phones and PDAs. Com puterworld presents an introduction to Wireless Application Protocol and Weh clipping. > 84

FUTURE WATCH

Their roots are in the rarified world of artificial intelligence, but as computing bots and agents become increasingly pervasive, their practical potential is enormous. • 85

PACKAGED

Building an enterprise portal isn't easy, what with the need to integrate legacy data and customize user interfaces. Some users say it's more cost-effective to huy an off-the-shelf portal package than it is to build the necessary tools themselves. > 86

GOING IT ALONE

out your own shingle? Working for yourself can be the most satisfying job in the world. uterworld offers words of wisdom from two people who have done it. + 92



PROFITABLE **CONVERSIONS**

FOR THE MANY COMPANIES that must conduct e-commerce by using different flavors of electronic data interchange (EDI), XMLSolutions Corp. promises to simplify conversions to the content-tagging language XML and allow new relationships with companies that can't afford EDI. The up-and-coming company will have to keep those promises to hold its own against well-financed competitors.

ADP Takes MShow on the Road With Sales Staff

Web presentation systems make

online meetings practical for some

HIS WEEK, While thousands of businesspeople board airplanes bound for meetings or

Data Processing Inc. (ADP) in Roseland, N.L. will begin holding monthly meetings via the Internet for its 350 salespeople who sell services to automotive dealers.

Dan Davis, ADP's manager of sales presentations for North America, uses a system from MShow.com Inc. in Highlands Ranch, Colo., an application service provider (ASP) that automatically formats and broadcasts various types of

content via the Internet. tent — even motion video — to 5,000 users at a time, but Davis

streaming audio and interactive chat Davis said ADP's presenta tion development staff will crease the slides and *blow

them into a show" (unload them to MShow's servers) prior to a presentation. Most attendees dial in via a local Internet service provider.

But Davis said MSbow.com's technology compensates for slow connections, even those of analog modems, by caching the streaming information to users' local hard drives. "While users are in a virtual waiting room waiting for the

presentation to begin the content from a recorded presentation is already going onto users' hard drives," Davis said. MShow.com also automatically detects handwidth constraints affecting users who are said he limits the broadcasts he logged oo in real time and dyprepares to PowerPoint slides, namically configures the con-

installs on enterprise server	Yes	_ No
Available as a located application (from an ASP)	Yes	Yes
Reading presenter's oldes and videos for webcasting	Yes	Yes
Drondoneto molio	Yes	Ves
Offers real-time politry	Yes	Yes
Humber of concurrent mers supported	1,000	5,000

tent accordingly, said MShowcom President John Rouse, A user whose system is overwhelmed by streaming audio. for example, might be prompted to listen on the telephone instead of through the PC's

a per-event basis, too, he said. Mike Malmquist has needs ADP's Web presentations similar to those of Davis, ingenerally use a primary audio cluding a desire to cut travel presenter and sometimes a costs and speed delivery. But sidekick who provides "color the Web analyst at Lutheran Brotherhood, a financial serthe way they do on a radio show," according to Davis.

vices company in Minnespolis, said the fragmentation prob-lem has been reduced, but files

Rouse said most large enter-

prise customers pay for the

which, on average, runs around

service on a subscription basi

is taking a slightly different anproach. Malmquist said he's testing the eVideo Application Server (eVAS) introduced two weeks ago by PictureTel Corp. in Andover, Mass.

The eVAS can either run on servers in the enterprise or be hosted by ASPs. It supports up

to 1,000 concurrent users. Initially, Lutheran Brotherbood hopes to use eVAS for online training presentations, Malmquist said, Like Davis,

he said he would record presentations for future replay. He also noted that eVAS supports polling by placing buttons into PowerPoint slides where users can click to respond to a poll. starts at \$25,000 for 200 concurrent users, according to

Picture Tel. Customers that use eVAS through an ASP will pay a onetime fee of \$55 to \$125 per con-

current user, depending on the ember of users "[PictureTel is] a little late, but they have some advantage with resellers and their experi

50 cents per minute per user. The company sells services on ence in video," said Suista Ramnarayan, an analyst at Gartner Group Inc. in San Jose. PictureTel said last week that the company would begin offering eVAS as a hosted service through its subsidiary 1414c within the next 30 days.

Chevron Cleans Up Fragmented Drives

Symantec's Norton Speed Disk Chosen

Having 30,000 users accessing

shared information on its servers led to noticeable system performance degradation at Chevron Corp. about 18 months ago. The problem was disk fragmentation.

The barrage of activity, in which users accessed Microsoft Corp.'s System Management Server, along with anplication and file servers, created the problem on laptops. desktops and servers, said Mike Wolfe, senior engineer of security at Chevron's information technology arm in San Ramon Calif

for three months. Chevron found that 33% of the files on

users' PCs and laptops had data stored haphazardly on the hard disks. Wolfe said The \$2 billion San Francis-

co-based petroleum giant's IT staff blamed the problem on the way Microsoft's Windows NT 4.0 Workstatioo stores data on hard drives. Data wasn't being stored sequentially, but wherever space on the drives existed, Wolfe said. The disk fragmentation problem

creased the number of calls to the help desk, he said. Looking for a fix, Chevron tested Symantec Corp.'s Version 5.0 of Norton Speed Disk for Windows NT and Executive Software International's Diskeeper 5.0, along with sev-

eral other products Wolfe was unable to name. Wolfe and his team picked Norton Speed Disk 5.0, citing better performance and more efficient

abling users to manage the defragmentation process themselves, Wolfe said. A cost-effective licensing and maintenance agreement was also a factor, he said.

sound system

per seat, but Wolfe declined to say how much Chevroo paid for its license. According to Wolfe, Norton Speed Disk has accelerated damaged some files and inhard-drive access for end users by an average of 20%, depending oo the particular fragmentation level and which applica-

Symantec's list price is \$49.95

tions were typically run. *Our support people felt like the Maytag [repairman]" as the number of calls for support decressed Wolfe raid

But not everyone at Chevron is impressed with Norton Speed Disk's performance. Rick Roller, Chevron's desk-

still need to be optimized better. He agreed that the way NT stores data on the drives is part of the problem.

Microsoft didn't respond to requests for comment. The fragmentation issue may be further resolved with the deployment of Windows 2000, which Chevron expects to carry out within six to 12 months, Wolfe said. The com-

pany will take another look at the performance and capability of Executive Software's Diskeeper 5.0, which is built into Windows 2000. Chevron may stick with Norton Speed Disk, or it may use both prod-

ucts, he said. Chevron's problem is a common one, according to Interna-

tional Data Corp. (IDC), a Framingham, Mass-based research firm. Over time, files can take 10 to 15 times longer to access, boot times may triple take hours longer, IDC said.

AT A GLANCE Chevron Picks Symantec Fix

The \$2 billion petroleum gia uses Symantec's Norton Speed Disk for Windows NT. Why: Chevron san into respor disk de

mentation problems when it implemented Mindows MT 4.0 Workstation, Agencylmately 30,000 desistant and lastoon

What happened: It looked at the prod-sots, including Norton Speed Dak for NT and Executive Software International's antomus and PCAmerhore soft

Reselts: Nortan Speed Desk for NT spe up machines by 20%, depending upo what applications are run. The de tation process takes about 15 minutes to one hour, depending upon how much lost



TECHNOLOGY

Large Variety of WAP Phones Make Testing Paramount

The Wireless Application Protocol | phones and other devices, but that doesn't mean building them is easy, (WAP) was designed to make it easier to build applications for handheld

There are so many kinds of wireless

so complex that testing is even more important with WAP applications than with other kinds, they say,

That's why application development managers at three companies buildi WAP applications for banking and other uses said they welcome a new testing lab and the online community of AnywhereYouGo.com, which is based in London with U.S. offices in Dallas. The site boasts 7,500 developers globally who can use free online testing tools and compare notes with one another. On May 10, the site also announced a laboratory in London for developers to test applications on up to 27 WAP phone models. A low-level test of an application could take about a week and costs \$750 while a more sophisticated test could last three weeks and cost \$7,500, Anywhere YouGo.com officials said.

"As a WAP developer, you do have to seriously test products across the phones out there. And as the number of phones grows, there will be a huge load on developing companies for runnine tests" said Damian Bown, CFO at Kizoom Ltd. in London, which is releasing a WAP application to bring wireless users instant access to tran schedules and fees based on their irinerary and location

"AnywhereYouGo is really going to help with changes in the phone product " Bown said

"With WAP we're very much like the world was in 1994 with the World Wide Web," said Michael Fuchs, webmaster at e-commerce server vendor Netfish Technologies Inc. in Santa Clara, Calif. There's a balkanization of devices that

Tim Youngblood, research director at Magnet Communications Inc. in Atlanta, said AnywhereYouGo.com is the only destination he has found that puts together testing tools with a comm cations hub for developers to share information. His company is build wireless banking applications for several large banks and plans to use the laboratory later this year, he said. All three companies have been testing applications in-house, but they said

the WAP world is quickly going to grow too complex for them to keep track of Typically, errors in writing WAP applications occur in adapting the

application for a particular device. And when an error occurs, it can shut out a user from a site, eliminating the application's efficiency. AnywhereYouGo.com recently con-

ducted a survey of 50 WAP-enabled Web sites and found 28% of them had errors, company officials said.

Speed is the main reason to do thorough testing. because you need to have speed to bring products

to market. DAMIAN BOWS ero of Rizon



ough testing because you need to have speed to bring products to market," Bown said. "The last thing you want is a user turning on a WAP phone and going to a service and finding it doesn't work."

The new lab validates applications using actual WAP handsets and gate ways, integrated with Anywhere You Go.com's proprietary testing software Officials said the service will ensure that WAP sites are compliant with in dustry standards and compatible with unique devices

For example, a company with a WAP application might find that certain phones don't support bold or italic typeface, which could make a company logo impossible to use. Bown said his company's applications will identify the kind of phone being used and let the application respond to specific

"Even though we test in-house, we know that we're simply not able to keep with the growing number of devices

and gateways," Bown said. "We're in the early stages of WAP, so it's not a bad idea for developers to compare notes and get a stamp ofapproval* from a company such as AnywhereYouGo.com, said Alan Reiter, an analyst at Wireless Internet and Mobile Computing in Chevy Chase, Md.

WAP is in its infancy in the U.S., ana lysts said, with much greater deploy-ment in Europe. Framingham, Mass.based International Data Corp. predicts that by year's end there should be about 99 million WAP-enabled Internet subscribers worldwide. That number is expected to surpass 744 million in 2002 and hit 1.3 billion in 2004.

Fortune e-50 run Oracle and 96% of the same Fortune e-50 run Microsoft SOL Server. Apparently. the Internet

is big enough

for both of us.

Just a reminder

the next time you think Oracle

has the only e-commerce solution

96% of the

Microsoft

Where do you want to go today?

Network Management in the Palm of a Manager's Hand

BY SAMI LAIS
Tivoli Systems Inc. says companies that use the new Tivoli Device Manager (TDM) can manage handhelds running the Palm operating system through the

company's framework software. According to Austin, Texas-based Tivoli, TDM allows access by the remote devices to resources such as networked data storage, it also lets systems administrators manage their Palms with the same Tivoli Management Enterprise (TME) Console they

use to run other devices. TDM works by means of a Device Actustor agent, a small piece of code that resides on each Palm handheld. The Device Actuator collects information to feed back to the system when the user synchronizes the Palm. The flow is in two directions: The Device Actuator can execute commands and download data from the TDM server as well as upload data.

Some of the new product's capabili-ies have been available individually from various companies. They've also been available from competing framework vendor Computer Associates International Inc. in Islandia, NY., rough its Unicenter enterprise manseement software.

But TDM extends the reach of systems administrators further than the competition, adding features such as omatic software distribution and removal, remote configuration, device ment via user-profile groups and inventory tracking, according to a spokesperson at Santa Clara, Calif.-based Palm Inc.

Concero, an e-commerce developent consultancy, was an early user of TDM. The Austin, Texas-based company can now update employees who work at multiple, changing sites and "use a variety of tools, including PCs and Palm devices," a Con-

"When wireless and pervasive devices are discussed, it's often in the context of individuals," said James Governor, an analyst at Illuminas Inc. in Nashua, N.H., in a recent report. "The real payoffs, however, are in groups. And it's as much about infrastructure as about devices."

VicRoads, a go road-maintenance agency in Victoria, Australia, was a TDM beta user. Each day, road inspectors and work crews use a custom application to on road condins and work performed into a

Lotus Notes database. Managers use information from both groups to make

When mobile staffers synchronize the Palm units, the Device Actuator initiates replication of their data to Palm and Notes servers and delivers the new assignments

release later this year As the number of handheld applica-tions grow, "management is going to

become a big issue," said Paul Mason, an analyst at International Data Corp. in Framingham, Mass. "People are doing

real work with them." Device Manager costs \$31 per device and the price of TME varies according

AT A GLANCE Tivoli Device

Manager AVAILABLE TODA

Pain OS support, inclu

a Support for Windows CE, Epoc32 (the i

European operating system for hundreids) · "Pull" software distribution, which will let handly users choose software to download

· Security features

 Backup and restors functionality # Wireless connectivity

■ Device Manager tools softwere development let

TDM was first released in March. New versions due later this year will support Windows CE, let handheld users choose software to download and include Tivoli Device Manager tools for software development.

Coming Seen

Set for release early next year is sup-port for Epoc32, Europe's leading handheld operating system, and security support for distribution and management of enhanced encryption. Palm last week announced its own

nagement product, HotSync Server synchronization software for Win



Crusoe Chip Launches in Web Device; IT Impact Unclear

Some IT managers hope the Transmeta Crusoe chip will deliver longer battery life and increased competition to processor giant Intel Corp.

But despite last week's announcement that Gateway Inc. would be the first PC manufacturer to use the chip, information technology managers say it's unclear bow much impact that development will have in corporate IT environments.

San Diego, Calif.-based Gateway said it will power its line of wireless Internet appliances with the Crusoe chip and the Mobile Linux operating system, both from Santa Clara, Calif,-based Transmeta Corp. Crusoe is a softwareupgradable processor that ansmeta claims consumes less power, takes up less space and runs cooler than comparable processors from Intel or National Semiconductor Inc. Gateway, which owns a stake

in Transmeta, said it chose Crusoe for just those reasons The company won't commeet on its plans for using the chip in notebooks or other devices. Compaq Computer Corp. and IBM plan to use it in ultralightweight portables later this year, said Rob Enderle, an analyst at Giga Informatioo Group Inc. Neither IBM nor Compaq would comment for this story.

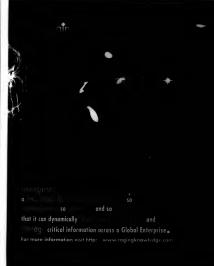
Corporate users are circumspect. Gary Bernstein, senior systems analyst at a global oil company, said he would be interested in devices based oo Crusoe because be's always looking for new technology. "Td at least give it a try."

added Jeff LePage, director of MIS at American Fast Freight Inc., a shipping company in Kent, Wash. 'In my opinion, it's best suited for smaller handheld devices, oot for the desktop," he said, "But I'd be willing to give it a shot." Crusoe's battery-life advan-

tage may dissipate, however, as veodors scale up from Internet appliances into notebook computers, said Tom Halfhill, senior editor of "The Microprocessor Report" newsletter in Sunnyvale, Calif. "Even if you're getting one-tenth the power consumption [from Crusoe), you won't get 10 times the battery life," said Halfhill, Another hot-button issue for IT managers is choice.

The more we get away from one-stop shopping from Intel some needed competition? meta is not putting much pres-

more expensive than an Intel Pentium III chip of comparable performance."



TECHNOLOGY

BRIEFS New NAS Systems

Our Minimum bar has been

duced the StorEdge M8000 files product family of enhance attached storage (MSS) systems. He first product, M8200, others 200 to 80068 and is available in the U.S., starting at \$54,000.

Syncsort Debuts Data Aggregation Tool

yeasert Inc. in Woodcliff Lake,

K / 14 /4 / WA

a software product that combines a high-powered data aggregation orpine with an easy-to-use graphical user interface, according to the company. Sigma's proprietary optimization technique uses a permanent central repository that stores

the approprie definitions; users can update three definitions and regenerate appropries with just a few clicks of a mouse.

Bata to be apprepated can be input from - and apprepated data can be estage to - file files in a Wendows or Unit file system or a relational databon remangement of those databon remangement of special systems or higher. AlX 4.2. INP-UK DO. 20, Solaria 2.8 and Windows NT 4.0. Pricing information want's available.

Ecrix Launches Tape Subsystem

Boolor, Cola. -based Earls Corp. recently introduced the YZA RaiPal, a raid-meetable tape subsystem that uses Earls's VISA technology for data recording and restoring. The YZA RaiPals states up to 12026 of data. N° competities with Lisura and Windows NT, SS, 68 and 2000. Shipments will begin this month. Pricing will be set at \$1,200 for a con-drive unit and at \$2,220 for a how-drive unit.

Network Appliance Introduces NetCache

www.ecriz.com

Sannyvale, Calif.-based Network Appliance Inc. recently lassicated in Michicach (2010 Med caching and Michicach (2010 Med caching and streaming media product. The CITOD transparently mirrors content, such as streaming training and security videos, to and users, The appliance is furnished with cess 500 SCSI hard-disk fore, 2008th greychronous dynamic RAM and dual 10M/s00M hideo. Ethernet ports and supports multiple's Ti connections for HTT caching and multiple T3 connections for obsessing media. Michicaels in priced at 55,500.

TrueSAN Line Offers Fibre Channel Support

TrusSAM Notwerks Inc., in San Jos has introduced the 7000FC series of Films Channel storage—area set work (SAM) products. Features include 2000BB of storage caught; that expands to 7 terabytes per stirage enthyption, plus sight need of SAM connectivity. The new seriellars standards-based manage most, remote reglication and claimment, remote reglication and claim-

boot. Eventually, we get the syste ck to normal, and it ran OK with ard Windows video drivers. er love or hate. I didn't care for

mewhat dim, low-contrast

and the Mobie to all the other

Among the monitors I looked at,

Finding this menter may pr

ViewSonic Inc.

63 300

s. But the editor who had al

m. since ViewSenic house

Flat's Where It's At

ON'T WORRY ABOUT the cost. Lie to your boss and the purchasing department. Lose the paperwork. Just go ahead and order one of those 18-in. flat-panel desktop monitors, then sit back and enjoy the view.

Yes, these devices still cost upward of \$2,500. No one ever said life was fair.

I've lived with a changing one, using a Hewlett-Packard cast of 18-in. LCD monitors for a while, and I'm thoroughly spoiled. There's nothing like them for everyday work. No flicker, tack-sharp images edgeto-edge and corner-to-corner. and good color. Lots of screen real estate lets me have several windows open at once. My eyes have never felt so good.

I tried four monitors: Compag's TFT8020, Nokia's 800-Pro+, Princeton Graphic's DPP-800 and ViewSonic's VPI8L The Princeton is a digital-only monitor the other three will take either analog or digital input. I wanted a video card that could display four monitors simultaneously, but that was a special-order item. So I compared the monitors one by and text may look terrible.

Co. Vectra VL600 PC running Windows 2000 with an ATI Technologies Inc. video card that has both digital and analog

I kept coming back to the Compas, though the Princeton and Nokia ran a close second. I did prefer using digital mode. because the image appeared on-screen faster and looked just ever-so-slightly better A cavear: These monitors were designed to run at 1,280 by 960 pixels, so your graphics card better have 8MB of video memory. Don't expect them to look quite as good at any other

\$2,995

This is Compag's sec

the back of the housi For graphics, I liked this

ag was a good all-aroun rp test, even at a lower

resolution. You can set them at 1,024 or lower, but at that resolution, images get distorted handle the high resolution, this is a



995.52

The Hokia looks diff tion 18-in. LCD deaktop man the rest of the monitors I tested. Nor. It comes with both the reg-Its face plate is quite shiry, givin more reflections than the other and the large, round controls at the tom of the acreen make the disand good graphics. It fell down on in that I had to push it to max



prised at how poorly this unit per-

rs. this one had a very

It has two built-in speakers and a



Princeton DPP800 Princeton Graphic Systems Inc.

\$2,800

This model produced very sharp screens, and normal deaktop and tion windows were the no of all, aith low as effect on finish as as the Compaq on photographi ages. Unfortunately, at less than test became the ugliest and most rmed of the lot - close to unus able, in fact. But as long as you can

Nokia Display Products Inc.



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Wireless Web Access

FUNNY THING happened on the road to handheld. wireless Web access: Microsoft Corp. chose a different route. As a result, analysts are divided over whether handheld Internet devices will rely on data downloads specially configured for minimum size, or on devices that can handle full-featured Web pages and graphics, even on their tiny screens.

Microsoft has chosen the second approach with its new Pocket PC software, while two competing technologies, Web clipping and Wireless Application Protocol (WAP) are designed to streamline access by structuring and reducing the amount of data that a portable

device needs to download. Web clipping, used for wireless Palm Inc. handhelds, works through a special proxy server on a wireless network Using a special application, the user generates a local query relative to data available on the Internet. The query is sent to the proxy server, which deteres what is needed, soes to the appropriate Web sites and retrieves the data. The proxy server compresses the data and sends it back to the Palm. where the query application displays the response. But this ks only with predefined types of queries (e.g., weather, e flights, theater times).

WAP, oriented more toward ternet-enabled telephones, doesn't use a proxy server; instead, it depends on a Web page that's been rewritten for he small screen in Wireless Markup Language (WML).

Pocket Internet Explorer for the Pocket PC is Microsoft's ver. It provides access to full Web-page content because it can reformat pages for better, more appropriate display on the Pocket PC's 320-by-240-

pixel color screen. Some analysts say the Microsoft approach will win out because it doesn't require converting HTML pages to anoth-er format for a limited audience of wireless users. But oth

DEFINITIONS

Web clipping is a technique for reducing the amount of data downloaded to a wireless-equipped Palm handheld computer with its 160-by-160-pixel screen. A proxy server fields queries from the Palm, gets data from Web sites and then sends a compressed response (typically 500 bytes or less) to the handheld unit. Wireless Application Protocol (WAP) is a standard aimed at delivering condensed Web information to specially equipped wireless telephones [Technology, Jan. 24]. Because these phones have even smaller displays than the Palm devices, WAP downloads are likely to be smaller than Web clipping responses

Pocket Internet Explorer, a part of Microsoft's Pocket PC software, is a browser that reformats pages on the fly to fit the smaller screen.

wireless users that next-generation Web pages will be designed for both wired and wireless downloads thus converting from wired to wireless won't be a problem. In the short term, analysts say, all three approaches will be used. Iain Gillott, an analyst at ational Data Corp. (IDC) in Austin, Texas, favors the WAP approach, which be says could be used with the Pocket PC and thus doesn't necessarily compete with it. WAP is likely to spread because more

are the chief backers of Web clipping, be says. As for the Pocket PC. Gillott says he's not sure why anyone would want all the PC capabilities on a handheld with such a small screen: "If I want that. I'll use the wireless modem on my PC. I have a hard time believing that a non-WAP-compliant browser will be successful." Gillott acknowledges that WAP today faces the problem of Web-page conversion - it can be used only if Web sites

ers say there will be so many | it, while Palm and its licensees | [Technology, Jan. 24]. But he says that's just a short-term problem: By the end of 2002 there may be more people with wireless Internet access than are accessing the Internet through a desktop PC. "Suddenly, the webmaster designing a new Web site sees that be or she has two kinds of users - wireless and desktop - and needs to cater to them both from Day I," Gillott says. WAP faces other criticisms. but Gillott predicts they'll disappear. "People are hung op on convert their HTML into WAP today. They say its user

very good. But this is Versioo L1, which I'd equate to Netscape LO. 1 think WAP will evolve very quickly, that versions 4, 5 and 6 won't look like Versioo 1," Gillott says.

Is More Better? fill House, a senior analyst

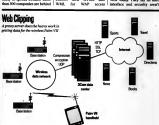
at IDC in Framingham, Mass., says she likes Microsoft's approach. The Palm and WAP approaches require too much Web site programming, she says, and won't reach bigenough audiences. Most wireless Palm applications require that Web sites be rewritten to fit a Palm Query Application (PQA), which handles data requests, "People with Web sites to run have enough to do without creating a PQA for a limited audience," she says. "The gating factor is volume. If you can show people who run Web sites that there will be a

they will develop for it." Web clipping will probably disappear, while WAP may yet become part of the eventual wireless download solution. House says. Microsoft's approach of shrinking Web pages to fit portable-device screens will deliver a usable view for some types of Web pages and

Jane Zweig, executive vice president at Herschel Shosteck sociates Ltd., a Wheaton Md., consulting firm, says that as wireless speeds increase, neither WAP nor Web clipping will appeal to users. Wireless downloads of 2M hit/sec. are possible, but it may take years. 'I'm not saying people will do all the browsing on a phone that they do on a PC with a landline today. But ultimately, the limited content available

will diminish the value propositioo" of WAP and Web clipping, Zweig says. The trouble with the debate over wireless download techniques is that none has a track record of either cost or demand, Zweig szys. I

Alexander is a freelance writer in Minneapolis. Contact him as



Undercover Agents

Their roots in artificial intelligence make them creepy to some, but as computing bots and agents become increasingly pervasive, their potential is enormous. By Steve Ulfelder

OU ENOW that beadyeved paper clip that
stares at you from
your Windows 98
applications! it's an intelligent
software agent. It's a cool one,
too — though most people will
never know that, because they
switch the creepy thing off as
soon as they can.
Perhams because of their

Perhaps because of their roots in artificial intelligence—
a field that overpromised itself into exite—agents were once viewed as a technology always set to explode. ...next year.
But they have exploded, albeit outeit. There are pleases albeit outeit. There are pleases

abeit quietly. There are plenty of software agents in use today. They're in help systems, many search engines and comparison-shopping tools. But you ain't seen nothin' yet. During the next few years,

During the bext tew years, as technologies mature and agents radically increase their value by communicating with one another, they will significantly affect your company business processes. Training-decision support and knowledge sharing will be affected, but experts see procurement as the killer application of business to-business agents.

business-to-business agents.
Intelligent software agents,
also known as "bote" (short for
"knowledge robots"), are programs that autonomously help
uners accomplish certain tasks.
Agents, which can be written
in a variety of pure programming
languages, feature triggers that
allow them to execute without human intervention. Most

agents also feature adaptive at learning of users' tendencies and preferences and offer pertension based on what at they learn about users.

One goal of software agent developers is to fulfill the ageold promise that machines will perform tasks that humans doo't want to do. Another is to delegate to machines tasks as which they are vastly superior to humans, such as comparing the price, quality, availability

s and shipping costs of items.

J. D. Knoods, editor of the

Web site BotKnowledge.com
and a graduate student at the
University of Baltimone, says
yagents can automatically perform intelligent searches, anuser questions, tell you when
an event occurs, individualize
an event occurs, individualize
course, comparison-shop, of
course, comparison-shop, of
course, comparison-shop,

Facilitating Change

As neural networks and other lineships articled intelligence disciplines improve, and as revelving standards let agents hop from system to system and communicate with one another. The value of locus may increase prometrically. An IBM contracts prometrically, and IBM contracts prometrically and IBM contracts contracting the another lineships and the contract stone years hence as a seetling militer in which billion of economically motivated software agents fined and process information, ..., ..., ..., ..., ..., and ..., a

ison-shopping bots such as mySimon Inc.'s and extend their premise to corporate purchasing and procurement, and you've got what Alexander Linden, a senior analyst at Gartner Group Inc. in Stumford, Conn.

calls "the hot issue" for agents.

Web-based exchanges such
so the one recently formed by
the Big Three automakers are
enabled by agent technology.
"I can compare prices, quality
and availability when I'm buying rextbooks. If I'm GM, why
not do the same thing when
I'm buying 700 million tons of
steel" Knode says.
Linden also points to finan-

Linden also points to financial arbitrage as a logical application for agents. Tracking currency changes, seizing on a stock's 'float,' computing minute advantages and executing deals within fractions of a second are jobs best performed using computer horsepower.

Of course, not every applica tion needs to earn or save billions. Pattie Maes, an associate professor at the MIT Media Laboratory, has long been at the forefront of agent developm As early as 1994, in a speech she gave at the Doors of Perception 2 Conference, Maes described the need for software agents. 'I'm convinced that we need [software agents], because the digital world is too overwhelming for people to deal with, no matter how good the interfaces we design," she said. "There is just too much information." Much remains to be done before software agents realize their potential. If agents are to collaborate and form a vast network of superprocurers, standards must take hold to address cation and security issues. The Defense Advanced Research Projects Agency is working on developing the

Knowledge Query and Manipulation Language, which will double as a message format and a message-handling protocol. As agent-based commerce takes hold, ethical and legal issues are sure to arise, because "soo many new business models are based on crawlers, agents and so on," says Linden.

Agents are sure to revolutionize industrial espionage, too. If you're not already paranoid about guarding your corporate data, check out Chicagobased Spyonit.com Inc.'s Web site. Its free tool sends bots out to gather information. It's easy to imagine using it to issue commands such as "Beep me when my competitor's org chart changes."

If nothing else, agents serve as another reminder to brush up on security procedures. Ulfelder is a freelance writer in Southborn, Mass. Contact him at ulfelder@earthlink.net.



I'm convinced that we need Isoftware agents], because the digital world is too overwhelming for people to deal with, no matter how good the interfaces we design. There is just too much information.

PATTIC MACS, ASSOCIATE PROFESSOR, MIT MEDIA LABORATI



counts receivables in real time, instead

Buving a carefully tailored off-the-shelf portal can be more cost-effective than building your own. By Lamont Wood

UILDING AN enter- ing that software isn't easy because prise portal to provide browser-based views of legacy data may sound simple. but it isn't. Portals require the integration of a wide

range of core corporate databases, as well as the ability to analyze data and personalize user interfaces Some customers and consultaots

have found that buying packaged portal software can cost as little as half as much as writing your own interface and data-integration tools. Deployment times, they say, can be only a third as long as the time peeded to build a portal in-bouse

Even so, creating a portal with even basic functions will usually cost at least \$50,000 for the software itself, says Henry Morris, an analyst at International Data Corp. in Framingham, Mass. Installation, customization, training and business-process changes can double that expense, be says.

Getting a portal up and running can cost \$100 to \$300 per user, although the per-capita cost begins to fall off sharnly at more than 2,000 users, says Randy Eckel, CEO of Infolmage Inc., a portal development firm in Phoenix. Most pilot projects cost \$100,000 to \$200,000. with final deployments costing some

multiple of that, he says. Some analysts and users say they agree that selecting software carefully can help minimize the costs. But choosmany of the packaged offerings are still immature or untested, notes analyst Madan Sheina at Aberdeen Group Inc. in Palo Alto, Calif.

A fully functional portal must provide access to structured data (which is organized in fields) and to unstructured data such as text, says Eckel. It also must provide personalized views to help users sort through reams of data and allow them to take some action such as analyzing information or

completing a transaction. Using a staged approach can make the process easier to justify, says John Ulery, a product manager at Computer Associates International Inc. in Islandia, N.Y. "But the planners need to see it as a process of building an infrastructure, a foundation for the future, rather than a single solution that is larger than

life," he says. The following three user sites are examples of companies where informatioo technology staffers were able to configure portals, spending what they felt was a minimum amount of money

No Portal, No Business Before eTime Capital Inc. could even

begin doing business, it needed a portal. The Sunnyvale, Calif-based company gathers information about when ducts are received by customers and provides that information to manufacturers over the Web. The procan then more closely track how soon

they should be paid, says Ricardo Jenez, eTime's chief technology officer. The service lets users track their ac-

of on moothly cycles, which both increases cash flow and makes that cash flow more predictable, he says Software agents written by eTime are placed in the systems of its customers and their shipping carriers to

collect key documents, Jenez says. These documents include sales orders. bills of lading, invoices and credit memos, all of which are converted into XML in eTime's Oracle database and analyzed.

To make it all possible, simple database access wasn't enough. Strong analytical and data presentation tools were also needed, Jenez says. The company tried other tools before settling on the Brio One product suite from Brio Technology Inc. in Palo Alto, Calif.

"Some were very good at reporting and some were very good for what-if analysis, and some were good at the portal end [for data access and presentation]. But Brio was the only one with the complete integrated package," says Jenez.

The suite includes Brio Enterprise, a business intelligence product for data analysis and presentation; Brio.Portal, for the portal interface; and Brio.Report, for batch reporting. A company spokesman says pricing for Brio One starts at \$50,000.

ETime executed the con Brio in mid-December and had a beta version of its portal in February. The full service was launched in early April. "We can't talk about the cost, but Brio ras extremely competitive - much better than some of the others," Jenez says. "Some were dramatically more expensive, and none were dramatically

A Microsoft-Centric Approach

A customer portal was also the aim of the California Casualty Group in San Mateo, Calif., which sells home and automobile insurance. Senior Vice President Beau Brown says the idea was to create a self-service ports where policyholders could view their policy information, request changes and file claims

"The main thing we were interested

TECHNOLOGY

in was a friendly interface, but quite a few portal (tools) had that," Brown says. "So beyond that, we were interested in the ability to interface to legacy

systems. The insurer's legacy applications ran on an IBM minisframe, with data ran on an IBM minisframe, with data stored in a DEI database. For another time quotes over the Internet, the company had been "wrapping" the existing code with Active Server Pages (ASS) and Composed Object Model (ASS) and Composed (AS

and COM.

The other chief attraction was the ability to cost-effectively perform complex customization of the user interfaces, Brown says, California Casculty markets its products through groups and associations, and the Plumtree interface could be personalized ac-

cording to customers' memberships, Brown adds.

Four California Casualty staffers attended a three-day Plumtree training course and were then able to put together a system to display billing and polley information in just 10 days. "Some of the portal [software] for

getter a system to dispay found and policy information in just 10 days. "Some of the portal [software] for things like accessing the glossary and searching the Web site were created in a matter of hours," Brown recalls. "We came in well under budget and

did not spend a lot on consulting services," he says. "It proved a lot cheaper to buy a portal product than to build one ourselves."

Brown says the cost was less than \$290,000 for the software and coosulting, which "was reasonable compared to the payback to our customers," he notes.

Offering real-time policy quotes will require that all the legacy systems be Web-enabled, a function Brown says he

Web-enabled, a function Brown says he expects to see by year's end. Meanwhile, customers appear to

have better data access than employees, but Brown says he plans to add an employee portal next year on the firm's intranet.

Sticking With What's Familiar

In the East Baton Rouge Parish School System in Baton Rouge, La., IT

managers decided to build a portal
while upgrading from a legacy mainframe to a client/server system, says
Bettye Whaley, the school system's program manager of information systems.
Previously, the school system used

previously, the school system used paper documents, which were input in batch mode to a Uninys Corp, mainframe. But because we wanted an online system' and were dissatisfied with several financial packages the detrict ran, says Whaley, "we decided to do a

major overhaul."
Moving to the client/server environment was less expensive than upgrading the Unisys box, Whaley says. The portal

the Unisys box, Whaley says. The portal also lets school staff generate and view reports on school district data from their browsers, she notes. Now, each of the district's 10 school sixes — hosting about \$7,000 students and 12,000 fullor part-time employees — is connected to an intranet based on TI lines.

The new payroll/financial and student information systems were implemented on July I, the start of the district's fiscal year. But legacy data and several secondary packages remained

on the maintrame. However, after choosing the financial pockage and the student information package, the district ended upwith two different database environments. Oracle on Windows NT for the financial system and information system, in 6th the student information system, in addition to the legacy data on the Unitys system. That meant three separate platforms on which to run reports.

Whaley says, with no ad hoc reporting tool to use. To access the Unisys data, the district had been using a reporting tool clind Ursa from Decision Support Inc. in Matthews, N.C. Its spin-off, Metagon Technologies LLC, also in Matthews, had begun offering similar Web-based multisource reporting tools, including

DQyista and access tool DQbroker.

"At the time, we did not look at anything else — we needed something fast, and since we knew how to use Ursa, there was no learning curve," Whaley

Because the district could stop paying for some mainframe applications, the \$30,000 cost for the tools was partially covered, she says.

"You can set up a report in 10 minutes or less, if you know your data," says Brad Mallett, a programmer/analyst at the school system.

Wood is a freelance writer based in San Antonio.

ETime Capital Inc. Pertal and far: Providing cus-

Product chosen: Brio One from B Technology Inc. Research to was the only tool eval

Resear: It was the only tool evalunted that included reporting, analysis and data access and pretentation capabilities.

California

asualty Group tol used for Allowing policyders to view pelicy informaa respect changes and file

Product obsess: Plumtree Corp

ware fac.

Researc Planstree's tools were
based on Microsoft technology
ready used by the customer, and

East Baton Rouge Parish School Dis

Parish School District Parish used to: Provide a single view of data stored on both mai frames and client/nerver system Product obsent: DQvista and DObrober from Metanon Tack-

Resear. The customer was from lor with an outlier mainframebased reporting tool from the



TECHNOLOGYEMERGING COMPANIES

Can You Translate That for Me Please?

XMLSolutions' EDI/XML translator automates document exchange processes

IRE GHISLER. of business development and technology at Richmond, Va.-based Envera LLC, is building an online trading hub for chemical companies. He wants the site to run smoothly, but he must solve a major problem first: automating the bill-paying process. After all, a high-tech transaction that ends with employees shuffling paper would

lose its new-millennium shine. Envera is a global electronic arketplace for business-tobusiness transactions and services that was established earlier this year by an international group of chemical and

num companies. Giesler turned to McLean, Va-based XMLSolutions Corp. for an approach that relies on the content-tagging language XML to translate electronic data interchange (EDI) inforthat arrone in the marketolace can read and process. XML-Solutions' XEDI Translator was a natural fit, he says, because its focus is on marrying XML, the emerging lingua franca of inter-

company data sharing, with EDI, which large chemical companies use for bill processing. EDI systems handle 20% of the transactions at the major chemical industry players, and shout one quarter of all industry companies have EDI capa-bilities, Giesler says.

Vendors have traditionally seen EDI translation as a way to get two similar but incomle systems to talk to each other, says Kate Fessenden, an analyst at Boston-based Aberdeen Group Inc. This perception arose because EDI evolved into slightly different flavors. As long as a company had a limited number of trad-ing partners, the information

few variations. More partners. meant more complexity.

Now, with a transformation engine like XFDI Translator she says, IT can toss out the ope-to-one software adapters. The new paradigm is to trans-late EDI into XML, checking

for errors in code, formats and sequences along the way, to format the document accordinvestment in XMI

EDF-to-XML tools could mean big cost partners, according to a

growing 80% yearly

Schofistal Ventures

200,000

Burn money: \$20 ml

ion from First Analysis Ventur

Capital, Optically Ventures and

Products/Pricing: XEDI Trans-tator, \$25,000; Scheme Central, \$25,000; Meta-X, starts at

mere: Envers, Advanced

Marketing Services Inc. and Keise Permanente Health Plan Inc.

Partners: IBM, General Electric

Information Services, Stuests

Software Inc. and others

\$10,000: Vocabulary Builder,

XMLSolutions Corp. on: 7929 Westpark Drive.

Suite 100, McLean, Vs. 22102 Telephone: (877) 965-9667 o

Web: www.emis.com liche: Bill payment and doorment exchange via XML

May It's worth watching: Allows IT to retain its investment

Company officers:
• Kevin Kall, co-founder and CED · Edwin Miller, president Company goal: To become one of the top plevers in the busine to-business e-commerce seace

· June 1998: Company founded · February 2000: XEDI launches · April 2000: Schema Central

Red floors for IT: · Expect to see comp ings from major vendors · Transistors aren't available for al

window

amunities with a smaller

ences and place it in a browser

"XML is breathing life back into EDI," Fessenden says. "Companies that have gone through the huge expenditure of investing in EDI doo't have to worry about it going away and being replaced by any other technology." In addition smaller companies that didn't have the resources to support EDI can now join these trading

To benefit from XEDI Translator, a company can't be too small says XMI Solutions CEO Kevin Kail. If your current costs for handling documents are less than \$10,000 per year and the system works well.

keep using it, he advises.

XMLSolutions' target customers are companies that spend more than \$10,000 per year to shepherd documents through their offices, have more than 100 trading partners and currently support EDI, Kail says.

Cost savings is the major benefit of the XEDI Translator. Kail says. He claims that the product can decrease overhead ranging from \$30 to \$100 for processing an invoice to \$2 per document. Fessenden

estimates the cost savings at a

more conservative 70% Competitive Drive Fessenden says the compet

tion is more customized and less flexible. By using XML, a general-purpose metalan-guage, companies can continue using their EDI infrastructures. XMLSolutions adds a layer for flexibility, eliminating the time and expense involved in implementing a new system. It bases the translations on peneral-purpose technology, so a change in a company's in-frastructure won't break the

process. XML translation is also bidirectional, so a firm can ments.
Finally, XML cashindle language trans-

emerging lation, so French and Italian companies, for Companies Italian companies, no companies con trade and comments in their native tongues.

Kail said the firm's products still have room for improvement. XMLSolutions has embarked on projects to improve XML Translator's communication capabilities, expand the document type definition and schema database and increase security features.

XMLSolutions' products are oung, acknowledges Fessenden, but they're good enough to fulfill the needs of large corporations. "It's like the next wave of bow to deal with EDI - the next leap of technology;" she says, noting that XMLSolutions is the company that others need to catch up with.

Johnson is a Computerworld contributing writer in Seattle. the buzz STATE OF

The Big Picture

operates is in flux, says Kate Fesser an analyst at Aberdeen Group. EDI says. The underlying business need cation integration, a larger area that involves tying together diverse busin nom proverká sruběle report volice Another issue is business to business integration - the living of a con pany's value chain of partners, supple

operations flow more smoothly The staffeing-horse here, EDI tra tion, has been attacked in two ways through value-added networks, who wantage is an established EDI info structure that others can tap; and through adapters, which tackle each XMLSolutions and its newer cor otors are trying to create a Star Treat type solution, a universal translator than

Netfish Technologies Inc. Santa Clara, Calif. www.cetfish.com

Netfeth is firmly in the EAI camp, using XM, as the glue to bind the companies in a value chain. It has a large war chest having secured \$30 million in Francing from Oracle Corp. and Bain Capital Inc.

OnDisplay Inc. San Ramon, Calif.

On District takes, so arigoter arrow which is a more expensive solution be cause its one-to-one translators requ constant upgrades, says Fessend Recently acquired by Vignette Corp., OnDesplay has plenty of backung.

WebMethods Inc.

Faurtau, Va. www.webmethods.com WebMethods' platform for basin business integration is more of a shotour approach than what Festured calls the "rife shot" strategy of XML-Solutions. WebMethods does into y integration, a piece of which is hooking together EDI systems. The dif-ference is that WebMethods' accorded requires some programming on top of

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Going It Alone

Dreaming of hanging out your own shingle? Here are words of wisdom from two people who have done it. By Bronwyn Fryer

certainly has its positive points. After all, a regular salary, paid vacations and health care go away the minute you quit the cubicle to strike out on your own.

Still, making the move from employee to employer is untionably exciting. And if you do it right, you can find working for yourself to be the most satisfying job in the world. The following profiles offer a glimpse of what it's like to go it alone

President and found Medium Inc.

Brian Dooner's idea - to create a new way for businesses to market on the Web had enawed away at him since he was a principal and "de facto CIO" at TL Ventures, a ven ture capital firm in Wayne, Pa. His brainchild became iMedium, a 43-employee firm that has invented a technology for

ding advertising and promotional links directly into images on the Web. Previous experience: Dooner began his career in the computer auditing and information technology consulting group at Ernst & Young International in New York. He then moved

into a variety of financial, operating and investment-banking jobs at Safeguard Scientifics Inc., an Internet holding company. During his seven years at TL Ventures, Dooner became an experienced venture capitalist.

tting started: In May last year. Dooner developed a business plan and presented it to his previous employer, Safeguard Scientifics, and its affiliated venture capital firms. He also received \$5.5 million in seed money. In February, the same funders provided \$7 million to further develop and market the idea

In seeking venture capital, Dooner says, don't be hesitant about divulging your business plan. "There's nothing more astrating to a venture capitalist than an entrepreneur that is timid about revealing an idea. It wastes both parties' time." Staffine up: The most important thing to ask yourself. Dooner says, is, "What will the management team look like? Assembling a well-rounded management team - including contechnical marketing and financial planners should be a top priority, says

"The typical, fast-moving start-up bires at least 50 people in its first year of operations and often before any real

for two or three days a week to take pressure off during the incubator stage, wheo staffing is critical." Dooner says. Marketing and sales: Again. leave it to the experts. Hire someone with the skills and experience to sell the product or service. The approach should be "both focused and flexible," says Dooner.

Don't make all the decisions

Leave most of them to wellchosen senior managers. Consider hiring an HR consultant

Challenges and rewards: "There is no substitute for the experience you get as an entrepreneur. If you can bear the

economic risk there is oo downside careerwise."

GUILLERMO PAYET

President and CEO Ocean Group Santa Cruz, Calif

IBM for six years. Guillermo Payet was amazed at big-com-pany inefficiencies. "The bureaucracy was stifling," Payer says, "So much energy weot

into politics. So in 1997, Payet Jeft to start Ocean Group, a seven-employee Internet engineering firm he runs out of a house-turnedoffice in the beach city of Santa Cruz. His goal was to craft a company that would be nonhierarchical and efficient. He also says he wanted employees to thrive in a creative, "laid

itting started: Like Dooner, Payet emphasizes the imp tance of a solid business plan. But unlike Dooner, he started the company with his own savings and credit cards. Since then, he's been bootstrapping. Ocean Group has "gone with the cash flow," which can be readic. Now Payet is talking

and that I'm doing it my way, he says.

Just the Facts

COMPRITERWOOD June 5, 2000

with angel investors to grow

the company. "You've got to plan well and have emergency urces of funding," he says. for their intelligence and their fit with the company's culture Payet says. Carefully define each person's role so you don't step on each other's toes. arketing and sales: Pave warns against too much business too fast: "If you want to build something visble, you want to grow only as fast as u can keep clients happy nges and rewards: Goinz from a large company to start-ing a successful business has been a long learning process for Payet, and he's had his share of 24-hour days. But the payoff is more than just mor tary. "That my dream is com ing true is the main reward

Fryer is a freelance writer in Santa Cruz, Calif.

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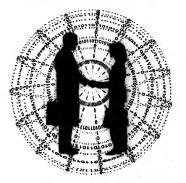


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IT Careers in Telecommunications

Just a year ago, telecommunications companies were duking it out for customers and developing new systems and IT applications to address multiple billings, varied rate structures and expansion into a global market.

Today, the pictur telecommuni industry uniqu

Today, the picture has shifted again. The traditional powerhouses of telecommunications are getting a run for the customer and the profits of this

industry as voice services begin to look more like a commodity than a unique offering. Instead, the companies are competing with new

players. They more comfortably fit into the communications industry where they can leverage their large customer bases with entirely new services, ranging from simple Internet connectivity to web conferencing, cable or data.

It's a shift into the broadband world, where infrastructure and new developments are the required elements to compete – for revenues, but also for employees.

that online world."

Quinn Hedrick

manager of corporate recruiting

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Cap Gemini LLI Clark, NJ

cap Genrill Group is part of the larger international firm. Cap Genrill LLC, which is in the midst of outsiring consulting firm from 8. Wang, Cap Genril's Dan Abbracatos, director of recurling and resource adlocation, caps one of the biggest challenges the firm faces in 2000 to shring the best and brightest. The areast haseder organization totals; The says, "topporting mobile features, DSI, busided and infrience communication."

Abhruscata believes the fedicatry is changing men new than everbelieve. There are major durages in the industry the lites of which we're mere seen." In says, "and it's due to the growth of package switch technologies. Mireline salephone is converging with we'reless technologies and a set of underline technologies that can carry voice, data, messages and video. When managing existing systems and wareling mes services into the min.

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Cap Gentel has training and development centers in Morristown and Clark, NJ, as well as Cleveland, OH. The company recently

launched a mujer const-training and skill-development intribite, howest as New Wave. Fifteen people each week are cross-tailmed into new product areas. "You will have the automory to seely year own skill interests, and our connectiment in to support the evolution of new technology." Advancation acids: "Re offer overlines projects in well-based solutions, and these are projects that typication is not acid to the control of the control of the control of the projects of the control of the contro

"Another real plus for Cup Genim is that IT professorals will have the opportunity to see different belecom environments around the globe," says "Abruscatto. "Europe is alwad of the United States in terms of wineless, so it's a great place to learn, Var'ill learn and see what other countries are doine."

to move on to senething new

DSL.net

New Haven, CT

DSL is the most familiar name in Internet connectivity speed. What few people know is that DSL net is a small start-up comp. ny with approximately 400 employees and plans to hire more than 600 this year.

Quinn Hedrick, manager of corporate recruiting, says the company assists customers with high-speed Internet access at flat rates, but it also does more: web hosting, remote LAN access or corpo-

rate network access, high-speed access to Internet-based video, virtual private networks, sehanced e-mail and e-commerce. We ofter a subtle of services designed to enhance the use of the Internet," says Hadrick. "Once we wire our service to your business, we also enoritar year connection and speed to make sare you am questing that best perior,"

"The best part of working in this environment is that is dwarming the most guident in the second vision in this environment is that is dwarming the most business section in the second vision in the second vision is dwarming to whether the most guident and the second vision in the second vision in the second vision is second vision secon

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The best part of working in this eminsonment is that it is dynamic. The ealine industry is where the most business activity is customed, and this is the laceboom of that continue quotif—any Hodrick, "Movil lie able to move around, from project to project, the grain generative, the grained training and experience that parties stated to gain superience. We grained training and experience that said still the said to the said to high, and you'll be surrounded by a let of slatest and skill."

Evoke Internet Communications

Voice communications is the tip of the iceberg in the communication industry, according to Evole Internet Communications. The idea behind Euglis Internet Communications is to use the Internet to expand and onhance communication for businesses. Evole Internet Communications is an Internet communication service provides. The company creates reliable and fissible ways to communicate by combities the obone and Internet.

The company is focused on new-generation comcation - the exchange of voice, video and visuals over the Internet. "We focus on helping businesses use these new capabilities," says Paul Berberien, CEO of Evolu. "We offer a suite of services that target different applications. whether it's a meeting or distribution of content through web casting, or talking a mail.

"What we've found most challenging is that the Internet market has many niche players - we're spanning across the market to offer an integrated package of services. Bringing together the services is very powerful," says Berberian, "Our software engineers are building cool communication experiences that combine technologies and let technology disappear behind the scenes."

Those who work at Evoke Internet Communications are playing in a large field of opportunities. Developers are working in wireless telephony, voice, streaming, online collaboration and high bondwidth applications. "We need people who are broadly skilled decathlen people who can jump is and work in multiple numblem sets," Berberian says. "We must build in reliability and scalability so that we can offer an industrial strength service.

"Me also need people who are open to a variety of technologi - who use what's best to meet a customer's needs," he adds. "We need people who are willing to investigate and research to find that hest unbetter

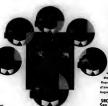
"The best part is that you get real-time freeback and the satisfaction of seeing your work used and embraced," Berberian says. "That's what keeps people here - that and the fact that we're constantly giving birth to new ideas and services."

Global Crossing Ltd. Rochester, M

By now the position of Global Crossing is well known. The onetime transoceanic fiber carrier is building a network of 200,000 fiber optic reites, linking five continuets and forming the infrastructure for worldwide communication. It's reason enough for the company to claire some of the best talent in the comm cations industry. "We deploy global networks with very hot technology," says Laura Porticello, director of corporate and technical staffing.

Among the company's top goals is to offer seamless end-to-end connectivity from Paris to New York, on to Yokyo. "With the net work in place, we will offer customers a diverse array of products," Porticula says. "On tier with these two goals is that we have an employee population with diverse talents to fuel our arrests modelwide "

In addition to the major initiative in deploying the fiber-optic network, Global Grossing is solling out an SAP implementation that will touch finance, payroll and human resources. The internal project is critical as the company continues its growth merch. "Me also are focused on product development," says Porticello.



pointing to projects in voice-over-IP technology, software and hardware. "We need engineers with network design or UNIX experience, software engineers, systems analysts and network architecture designers,"

The company has an aggressive college recruiting effort to hire network engineers. Once on board at Global Crossing, employees receive 100 percent tuition reinbursement for degraes up to a Ph.D. "And you can choose between technical and management career paths," Ponticello adds.

Porticello looks for people with intern or work experiences and degrees in computer science ar electrical engipresing. For more experienced hires, she is looking for people with three to five years emerience in a communica tions or software command "We also need people with excellent interpersonal skills who can deal with the customer at all levels, and some-

In equipment recover.

one who has spirit."

The company offers locations in Rochester; Merristeum, KJ;

Beverly Hills: Detroit: Sunnyvale, CA; London; and Amsterdam,

Riverstone Networks, Inc. Santa Clara, CA

In just over six months Riverstone Networks has grown from an idea to more than 300 employees. The company provides infrastructure solutions for metro area networks, and its customers include Internet providers, application service providers and content service providers. The list includes British Telephone, MCI Worldcom, Teleforics and Earthbisk.

"Our products are Internet routers, application-aware switch routers, intelligent load balancers, web cache redirectors and software tools for provisioning, billing, monitoring, and monaging service level agreements. Our products anable racid deployment of high speed service rich infrastructure," expl Andrew Feldman, vice president of corporate marketing and corporate development.

The company is searching for engineers with four to five years of experience in hardware or software design "We need top caliber people who are seeking to work with an extraordinary tears and who are willing to commit the energy and time required in a high purific start-us," spus Feldman.

White the company is young, Riverstone can beest of a highly experienced management tears. "Our management team is proven," says Feldman, "and they led such comparties as Yang and Cabeltree."

"It's an exciting space to be in. Unlike many start-upo we have a revenue stream measured in the tens of millions already," he adds. "The colleagues you'll work with at Riverstone are unparalleled. If you are seeking to work on best of breed technology, while working with truly phenomenal colleagues, then you should consider Riverstone Networks,"

San Antonio, TX

Through its subsidiary brands (Southwestern Bell, Americach Pacific Bell, SBC Telecom, Nevada Bell, SNET and Cellular One) and world-class network, SBC provides local and long distance phone service, wireless and data communications, paging, highspeed Internet access and messaging, cable and satellite television, security services and telecommunications negioners, as well as directory advertising and publishing, Internationally, 580 har tales promunications lavestment in 22 countries. With more than 208,000 employees, SEC is the 13th largest employer in the **Enited States**

"It's an exciting space to be in Unlike many start-ups we have a revenue stream measured in the tens of millions already. The colleagues you'll work with at Riverstone are unparalleled."

Andrew Feldman vice president of corporate marketing and corporate development RiverStone Hetworks, Inc.

> SRC's growth strategy is focused on initiatives in data service wireless services, long distance and netional expansion. Most can't be accomplished without a software system or billing capability that's ready when the company wants to go to the marketplace. It's the job of SEC's information technology expanisation to provide a competitive advantage to the corporate business. units by delivering the systems and capabilities needed to achieve their operational goals. At the same time, IT makes sure existing systems run smoothly and efficiently for the benefit of

> "SBC has approximately 17,000 employees werking in the IT organization," says Renne Schneider, executive director of infermatter technology management staffing and contractor acquisition, "with key population centers in St. Leuis, San Ramon (CA), Chicago, Dallas, Houston, New Haven, San Diess. Sacramento and Tree Off).

the company's customers and employees.

"We're a state-of-the-art organization," continues Scheelder, with responsibility for all enterprise software solutions, data center cogrations, desisten and other infortracture issues, and TI functions for S&C's wireless, long distance, and directory operations. While SBC is looking for relational database, software and system developers, the focus is on people with strong IT skills who are excited about working in data, web or telephony, the more skill sets, the more versable the assignments."

SBC offers both managerial and technical career poths. "More and more we're tooking for business skills because of our need to closely allien with our business units," says Schneider, "We're a company that has been built on internal promotion. If you are doing a good job, we will let you try something entirely new - and train you in the skills that will help you succeed. We know that seedle chance employers when they're no larger challenged, so we work with you to provide new challenges within the same company.



"When all is said and done," says Schneider, "the right ich in about enjoying what you do. People here enjoy their work and the critical role we play in the success of S&C."

Sprint Kansas City, MO

While Sprint is destined to take on the name Moridcom later this year, the company continues to build its IT presence at the Kansas City location. According to Ric Welter, assistant vice president for human resources, Sprint's II organization develops, implements and maintains services for the long-distance

Among the top IT projects is Sprint IDN, an integrated on-demand network. "Besically, Sprint 10H takes broadband into the home," explains Walter. "We are looking to the IT mais to help us with software to program, to support billing and to support all aspects of the business infrastructure."

Sprint has a robust college-recruiting program that brings in 300 computer science graduates each year. After completing training specific to Sprint platforms and systems, they are then assigned to a wide range of projects. In reviewing applications, Wulter looks for a strong educational background, demonstration of diverse experiences and the ability to be a contributor or leader on successful projects. The company seeks employees for electrical engineering, computer science, desktop support, programreing, systems engineering and network design.

"We continue to support ongoing learning through formal classroom settings and computer-based programs," says Welter. "We do have a formal career path effort to make sure that people get the experiences they need to be happy in their careers. With the merger with Worldcow, you'll be able to take your career any place."

Walter says one of the most attractive aspects of Sprint is that it is viewed as an innovator in the telecommunications industry. "From the first fiber-optic network to Sprint 10%, innovation has been the underpinning of our organization," he says. "Sprint PCS was tounched using leading-edge technologies. We frequently are the company that is out in front, because thet's the only may to stay on top of the market."

Just as important, Walter believes, is the environment in which people work. "You'll be working with your friends at Sprint. We offer an environment that's conductive to your personal prowth and what's important to you. We offer a challenging work environment, but we also offer familia work schedules and encourage employees to get involved with their researchies. We want needs to do those things away from work that keep them sharp."

Tellabs, Inc. Warrenville, IL

As with many telecommunications companies, the shift to e-commerce and an e-world is all new for Tellabs, Inc. "Me have always designed, developed and produced telecommunications equipment." says Bebble Toms, senior technical recruiter of Tellabs. The company is now extending its pascations as the infrastructure builder of the industry. By partnering with communication service providers around the world, Tallabs is developing conducts and services that allow contomers to offer new revenue-generating services white driving Awar costs.

"Today we're teoking for people who have skills in HTML and Java. The objective is to move us ahead in e-commerce, fecusing on electronic transactions. We use SAP as the backbone of our business operations in a client/server environment. Now we need web-enabled applications, systems and networking."

Listed among Fortune Magazine's *100 Best Companies to Work for in America", Teltabs hires approximately 40 parcent of its employees based on employee referrals. In 1960, 89 percent of employees said they would recommend the company to friends and family seeking employment. "That is quite a statement about Tellahs," says Toms, "About 50 percent of our positions are filled by people from within the company "

The company continues to focus on people as its strength. In developing the new company beadquarters building in Napierville, IL, the design includes health facilities run by a professional health fitness firm and arcite daycare. A proug known as DreamQuest is dedicated to working with each employee on insoutery make and how the remnany can support individuals in terms of job opportunities and

creating learning.

Tellahs has major development sites in Desmark, Finland and Ireland. "We focus on people being excited about their work versus being stressed," adds Tons. "You can tell the difference when you walk to - the undertow is one of excitoment and staying on top."

riceStream Wireless Corp. Bellevue, WA

In less then a decade, VoiceStream Wireless has grown to provide wireless phone service in 23 of the 25 major markets in the United States. It's part of the centimed national expansion of the company. A portion of the growth has come from mergers and acquisitions. This year, VoiceStream is combining its assets with those of Omeripoint and Aerial to serve more than 1.8 million curtamen

And that's presenting an internal and external challenge for VoiceStream's IT professionals. Julie Pollant, vice president of customer operations and systems, says among the first initiatives is assuring that seven different call centers offer the same service to customers and the company has a common platform to support all facets of the business. "We're responsible for these initiatives, along with many others up to and including the intecration of seb services with the wireless world." she says.

Pollard's organization is the IT but, while distinctly not including information technology in its same. "We're the framework for the company, and we're involved in everything from combining three large companies on to a consistent platform to developing services," she says. "As the backbere of overall services delivery. we have a business objective beyond a specific technology.

The fundamental is that this company has to be constantly available and ready for change. In IT that means that we must avoid restrictive standards and instead offer guidelines that allow us to be incredibly Revible. The technology is going to change, therefore, we have to be ready to change as well."

Pollard plans to hire about 100 IT professionals in the coming months. "Strong technical skills are a given," she says. "It's more difficult to find someone who has that entrepreneural aptitude, who tooks for opportunities to make change. These are the kinds of people we take in a hearthest over those who may have more experience but not the characteristics. We look for people who have shown a consistent pattern within their careers for finding new opportunities and challenges within the same commany."

According to Pollant, VoiceStream offers technical challenges ranging from call center to billing, product development to weblement. "We look for people who may have core competencles but who have a desire to broaden and stretch to other areas," she says. "I don't think there is another common that offers the number of technical opportunities that we can."

The company offers a casual environment that is about more than merely cictiving, according to Polisot. "We avoid rigid structure. You make decisions. You make things happen. That's the



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SEC May Loosen Reins on Foreign Biz

Mulls relaxing rules for stock listings in U.S.

MERICAN COMPANIES have long worried about foreign competition for customers - now they're increasingly starting to worry about foreign competition for investment dollars as well.

The Securities and Exchange Commission (SEC) recently finished receiving comments about a proposal that would allow foreign companies to be listed on U.S. stock exchanges without

having to comply with U.S. accounting More than 1.200 foreign companies are already listed on U.S. markets. according to the SEC, but they have to comply with the U.S. Generally Accepted Accounting Principles (GAAP).

Under the SEC proposal, foreign companies would only have to comply with the International Accounting Standards (IAS), which are set by the International Accounting Standards Commission (IASC) in London.

In general, IAS rules are looser than GAAP rules and give companies more leeway in bow they add up their numbers, which would give companies that follow IAS an unfair advantage in shoring up their bottom lines, says Roger Jahnke, director of international accounting standards at New Yorkbased Ernst & Young International.

For example, U.S. GAAP rules require companies to take a charge when

ting stock options. However, IAS rules don't, which would make foreign companies look more profitable than domestic ones, according to Alfred Popken, a director in New York-based PricewaterhouseCoopers' global capital markets group

In fact, Popken adds, the U.S. has the strictest accounting standards on the

As a result, some foreign cor are jumping on the U.S. GAAP bandwagon to gain the credibility that SEC approval gives them,

Popken says. According to Popken, the SEC isn't likely to endorse the IAS until that set of standards becomes as tough and comprehensive as the U.S. GAAP. But international pressure for

one set of common rules is increasing. Last month, at an annual meeting in Sydney, Australia, the International Organization of Securities Commissions said it would back the IAS for crossborder offerings and listings. This worries some American accountants.

"I believe that the SEC should either continue to require companies to reconcile to U.S. GAAP or, if they want to allow foreign companies to come into the U.S. under IAS, they should also allow U.S. companies to choose IAS." Jahnke says. "We ought to have a level playing field."

However, "we consider that the recognition and measurement requirements of IASC standards are sufficiently robust not to require a reconciliation to U.S. GAAP in cross-border filings," says Bryce Denison, national president of the Group of 100 Inc., an Australian organization of senior finance and accounting professionals that monitors

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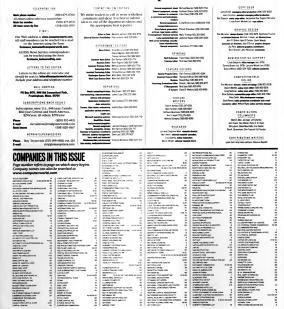
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Firms Purging Staff With Obsolete Skills

Despite employee shortages, firms say some workers can't learn hot skills fast enough

BY KATHLEEN MEI VMINA HE HUNGRIEST in-formation technology labor market in history is a fussy eater If it wants sushi and all you can offer is quiche, you're out the door quicker than stale bread That has been proved by a ate of recent layoffs among IT vendors and service providers, including IBM, Hewlett-Packard Co., KPMG Coosulting and Ernst & Young LLP.

Those lavoffs are different from job reductions at companies such as Compaq Computer Corp. and Xerox Corp. which recently announced cuts in an attempt to bolster sagging profits. Nor are they like terminations among the dot-coms that have his the skids. They're not workforce reductions; they're strategic

divestitures of people who have unwanted skills. The year dors are dumping staffers with tepid IT skills out the back door while luring hot new talent in the front, analysts said. These problems will have a direct impact on user companies that continue to get more of their technical specialists from contracting and consultanting firms while reserving

staff jobs for business technol-

ogists with deep knowledge of their particular industry, said David Foote, a managing partner at human resources consultancy Foote Partners LLC in

New Canaan, Conn. "The big problem consultants have is the ability to reskill quickly enough to capture new business," said Tom ConsultingInfo.com in Keene N.H. Established companies that might be loaded with enterprise resource planning skills have a real problem keeping up with the electron-

Rodenhauser, president of

ic-business expertise of nimble

the other" Weighing the Options

For example, last week, IBM Global Services announced that it was terminating the jobs of about 1,000 U.S. specialists in Y2k and other completed projects. Spokesman Scott Brooks said the company's first choice is always to retain and retrain. "But retraining is weighed against other candidates for the jobs who may have skills that are better," he

boutique players, for example.

training isn't always practical

"They've got to turn a lot of

grunt soldiers into Army

Rangers, and that's difficult,"

Rodenhauser said. "It creates

the strange circumstance of

laying off oo one hand and des-

perately looking for skills on

In these circumstances, re-

evalsined Similarly, HP recently announced that it would turn over about 5% of its workforce this year, and New York-based Ernst & Young laid off 9% of its consultants in February Foote agreed that retraining is easier said than done. "Usually, less than 5% [of workers] can do that," he said. And many have personal assendas about what training they want that may or may not mesh with

the needs of their companies To realign skill sets for the Internet economy, KPMG Consulting LLC, a division of KPMG LLP in New York, recently laid off 350 consultants. even though it expects to him 2,000 new ones this year. The company is looking for enecific technical expertise, not just general management skills according to spokeswoman KPMG Elizabeth Brooks. "You can't just do strategy. You have to understand the technology that you're building the strate-

gy around," she said Despite the "huge emphasis the firm puts on training, it isn't enough to get workers up to speed in highly technical areas with which they are unfamiliar For example, Brooks said, at KPMG, the integration of legacy telecommunications infrastructures with Internet technotogies is among the hottest skills. "That's a pretty specific skill set, and you can't just send someone to school for a few months to learn that," she said. Today, speed is everythi Rodenhauser said. "The sud denness and incredible demand for e-business projects is overwhelming for every body," he said. "It's a feedingfrenzy mentality: How can we get our share?"

Lavoffs Amid a Labor Shortao

PM8 Consulting Ernet & Young

350 9% of consultants

Continued from page 1 INS Backlog

should consider ways to streamline the green-card application process. "There is such a shortage of technology talent today and when we don't have the [talent], it affects the bottom line. There's an opportunity cost. Inefficiencies in processing green cards for employment -

rather than for foreign family members - have led to a growing chorus urging Congress to fix the visa system. For example, technology bigwigs Linus Torvalds, Esther Dyson and Steve Wozniak recently signed a letter to Congress on behalf of the Immigration Reform Coalition to help foreign work-Raj Shah, CEO of Capital

Technology Information Services, Inc. (CTIS) in Rockville, Md., said the problems in creencard processing impede not only how he runs his business, but also the economy as a whole. Every foreign employee Shah hires to perform development work creates demand for another three U.S. workers, whom he

assigns to maintenance, training and testing-related jobs. DeFruscio said employees have an easier time receiving green-card approvals if a foreign worker has spent time in the U.S. When a company files a green-card application is must prove that the person possesses "specialized skill or nowledge that doesn't dis-Schmidt said the INS back-

place" a U.S. worker. log on visa processing dates to almost two years ago, when the agency saw a large increase in tions. Right now, it takes an avcrage of 33 months to process a green-card application for a foreign national, but the INS hopes to reduce that to 24 months by the end of this year. For workers from India or China, the wait can be up to five or six years because the number of applicants from those countries regularly exceeds the 9,800-person limit

on immigrants from any single country, said Liz Stern, an immigration attorney at Shaw Pittman in Washington Some employees may lose H-1B bolders who reach the sixyear timit on their visus without obtaining permanent-pesident status, said Stern.

John Nahajzer, senior imm gration counsel at MicroStrategy Inc. in Vienna, Va., said it would be devastating to lose an H-IB holder who has been with the number of visa applica- the company for six years.

Tips for Handling Worker Visas

applying for permanent residency from the INS

ss early - as soon as 90 covery visa, according to Los

soon as I get an H-1B, firs th can take years to proc



FRANK HAYES/FRANKLY SPEAKING

The worst case

HAT'S THE WORST-CASE Microsoft scenario?
Suppose Microsoft loses its appeal and faces being split up by Judge Thoms Penfield Jackson. What then? Microsoft's lawyers and executives call any breakup a death sentence, but each piece of a sliced-in-two Microsoft would still be huge compared with most software companies. The pieces could survive.

The real problems — at least for corporate IT shops — will show up if cooler heads don't prevail in Redmond. Any extreme reactions

The real

problems

will show up

if cooler

heads don't

prevail.

from Microsoft could disrupt our ability to get the products we need — and that would send us scrambling for replacements, alternatives and new strategies. We'd better be ready.

So what ore the worst-case scenarios? And how bad could it get? Suppose . . .

and the state of t

facts tries to shut down the company instead of breaking it up. Very ugly. Shareholder lawsuits would stop the shutdown, but in the meantime, we'd face productavailability chaos.

availability chaos. To from technical talent deserts liferouch. Management brain drain is already a problem, since so many top executives have left recently. But for technical via sunder storry. Microsoft doesn't depend on a few technical quarts but on mess mobilization of an army of bright young kids hinder straight out of school. As long as there are computer science graduates, Microsoft in needs.

Microsoft competes with itself and produces incompatible products. A survivable problem. Today, Microsoft has hundreds of competitors that produce products more compatible with past and current Microsoft products than Microsoft itself. Microsoft can learn how, too. Class action leavaits drial Microsoft financially so it can no longer develop or but you we technology. It could happen, but more likely Microsoft will settle as many lawsuit as quickly and cheaply as possible, the way it settled the Caldera suit. Microsoft violates court-ordered restrictions on its behavior and gers slapped with even more limits. Remember, this is the company that presented a doctored videotage as trial evidence and swore

it was authentic. The more limits, the more some Microsoft employees will push those limits and break the rules. Unless Microsoft's executives and managers take the court's orders very seriously—and enforce them scrupulously—Microsoft could face an escalating spiral of crippling.

restrictions.
The broken-up Microsoft companie break themselves up further, making them prime acquisition targets. In that case, forget about complex interestion between

gets. In that case, forget about complex integration between ex-Microsoft applications especially if their new owners are direct competitors. The now Windows operating system

The new Windows operating system company merges with a PC vender. Insanely stupid, since Windows would suddenly become much less attractive to all the other PC venders. But don't put it past a broken-up Microsoft's new management.

An unexpected technology shift renders Microsoft irrelevant. And won't Judge Jackson feel silly? Bad news for Microsoft, catastrophic for the rest of us who would have to absort that who

would have to absorb that buge technology change. If it really would make Microsoft irrelevant, it would make most of our skills irrelevant, too. 9

Hayes, Computerworld's staff columnist, never envisioned a worst-case scenario in which he would cover IT for more than 20 years. His e-mail address is frank, hayes@computerworld.com.

SHARK TANK

FOR OLD TIMES" SAKE Mandecarring company cans de. CEO. Sur month sites, he lands a plo elawahere and calls our poly less, a specim administrator at the menufacturer. Tucket my voce mail. "the fish says. To hear our ser-CEO say," They, I titled dishing into the network over the weekland, but verry time of wouldn't let me in. Can you other me acid and let me you own me a call and let me.

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know when you have it fixed?" "

to the light switch."

GET THE MESSAGET The help desk plot fish takes a call from a company honcho and dispositions a trouble ticket and altech prortio. Hours later, the honcho calls car lish back:

Where is the tech you previous ASAPT? The lish thacks down the tech, who explains that the want to the user's office, found to

future reference, I pointed him

It empty and e-mailed him to call when he returned. Growls the fish. "The user's problemclearly stated in the trouble ticket - was that his e-mail wash? working."

TWO YEARS of cleaning up a

wome them typical mess gets this or ement? I shop joil fails his neward a pink sig, because, the boss says, "computers don't need programmer or operators, they can run themselves." The fish resists an urge to bootly trap the systems, but it doesn't resight matter. After sor months of "sun-rang florenosites," the hast, the systems are "so far out of sync with everything that they're totally useless." and the company of the content of the

DON'T BLINK On May 31, this plot fish is company buys Web application server licenses. Sorver vector e-mails license keys and into on support opinion. "One line caught my eye," says the fach. "You will recover line upgrades of this commercial license with June 1. You can also continues to see the server.

has gone back to manual book

Tell Sharky your tale. If it prints, you get a sharp Shark shirt sharkylfromputerworld.

com. And get more every day at commuterworld.com/sharky

after this date "

The 5th Wave



I APPRECIATE YOUR COMPUTER HIS 256 COLORS, I JUST DON'T THINK THEY ALL HIG TO BE USED IN ONE BOOK REPORT."

best e-customers like favorites and they'll do the same for you.

They come. See. Maybe even buy. Then they leave.

And that's when your selling job, not to mention your success in e-commerce, really begins. The SAS® Solution lets you combine the Web data a customer left you seconds ago with the purchasing, behavior, and demographic data you've been keeping all along. And that makes it easy to:

Get to know your e-customers...delight them by proving you understand them...personalize your interactions...and predict their changing needs.

Build strategies to retain customers...cross-sell to them...and make the most effective use of *all* your marketing channels.

Improve your Web site by analyzing who clicked on what and why...and which pages customers come back to most.

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